SEPTEMBER 3, 1951

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Look over the program in your business paper

Budget your time

Register in advance if you can

Be prepared to ask pertinent questions

Take notes on what you see and hear

Participate as much as possible

Talk shop with other people

Know something in advance about the major speakers

WHAT THEY THINK ABOUT CMP
—*House Committee Gets an Earful, p. 59*

MORE PRODUCT APPLICATIONS
—*In Porcelain Enamelers' Ovens, p. 62*

DROP HAMMER TECHNIQUE
—*Compound Curves Formed Easily, p. 88*

MACHINING MAGNESIUM ALLOYS
—*Back to Fundamentals, p. 91*

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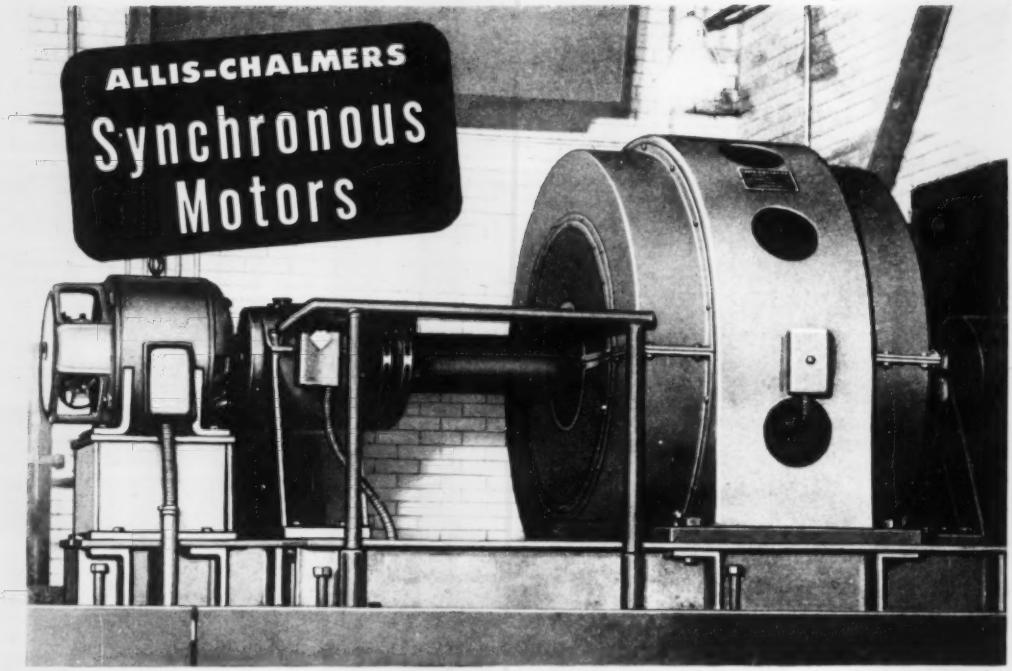


1000 hp, 0.8 pf, 6900 volt, 720 rpm motor driving sintering fan

Chosen for TORQUE, POWER FACTOR AND EFFICIENCY

When United States Steel Company needed a sintering fan drive for their Gary Steel Works sintering plant, they chose the Allis-Chalmers motor shown above. A synchronous motor was selected for this application for three reasons:

1. *Pull-out torque* of synchronous motor varies directly with applied voltage, while breakdown torque of cage motor varies as square of voltage. Thus, synchronous motor can stand greater voltage drop without pulling out of step.
2. *Plant power factor* can be improved, with consequent reduction in power costs and increase in overall plant efficiency. Fan and other steady load centrifugal drives are ideal for power factor correction purposes.
3. *Efficiencies* of synchronous motors are higher than those of cage motors.

When you add drives or repower old ones, it's wise to consider these advantages. Judicious use of synchronous motors pays off in dollars and cents.

Pioneering Applications

It's good logic to turn to Allis-Chalmers for assistance with your application problems. A-C engineers pioneered the use of synchronous motors for main rolls and piercing and expanding mills in the steel industry, and for many other applications with unusual torque problems. This wide background of experience can give you motors engineered to fit your requirements.

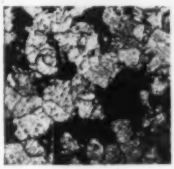
Helpful Information

Get in touch with your nearby Allis-Chalmers representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. New bulletins, 05B7648 and 05B7649, describe low and high speed pedestal bearing motors in ratings approximately one hp per rpm and above. Bracket bearing motors are covered by bulletin 05B6112. Bulletin 05B7465 explains power factor correction calculations.

A-3400

ALLIS-CHALMERS

How to select grain structures for better machinability of alloy steels



Blocky Ferrite, Low C

Spheroidized, Med. C

Lamellar, Med. C

The combination of grain structure, ductility and hardness has, in general, much to do with the degree of machinability of an alloy steel.

For purposes of comparing different types of machinability, all alloy steels may be grouped in three carbon ranges: low carbon, .08 to .30 pct; medium carbon, .30 to .50 pct; and high carbon of .50 to .80 pct.

Each of these ranges must be considered separately, as each has a pronounced effect on the corresponding grain structure and machining properties. Certain grain structures may be well suited for one type of machining and at the same time wholly unsuited for others. For example, in a medium carbon range, an alloy steel with a spheroidized structure may be good for turning operations, poor for forming, fair for drilling, and poor for broaching. This, of course, means that a compromise must usually be accepted to get the most economical overall machinability in any one grade of steel.

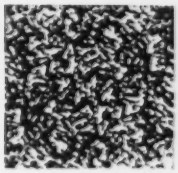
The table shown here is a suggested guide. It contains various combinations of carbon range, heat-treating process and structure believed to be most suitable for each type of machining.

Our metallurgists will gladly furnish further information on the relative machinability of various alloy grades. Call or write for this information.

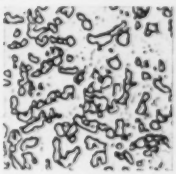
Bethlehem is a dependable source for all of the AISI alloy steels as well as the full range of carbon grades and special steels.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

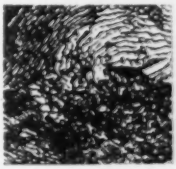
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



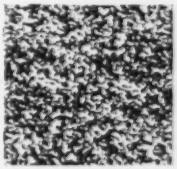
Sorbitic, Med. C



Spheroidized, High C



Lamellar, High C



Sorbitic, High C

CARBON RANGE	PROCESS	STRUCTURE	TURNING	FORMING	DRILLING	BROACHING
LOW (C .08 to .30)	Normalize or Anneal	Blocky Ferrite	Good	Good	Good	Good
MEDIUM (C .30 to .50)	Anneal	Spheroidized	Good	Poor	Fair	Poor
MEDIUM (C .30 to .50)	Anneal	Lamellar	Fair	Good	Good	Good
MEDIUM (C .30 to .50)	Heat Treat	Sorbitic	Fair	Fair	Fair	Fair
HIGH (C .50 to .80)	Anneal	Spheroidized	Good	Good	Good	Fair
HIGH (C .50 to .80)	Anneal	Lamellar	Fair	Poor	Poor	Poor
HIGH (C .50 to .80)	Heat Treat	Sorbitic	Good	Fair	Good	Good

BETHLEHEM ALLOY STEELS

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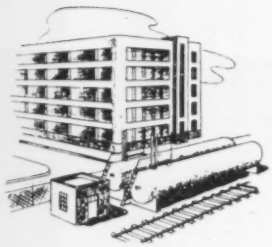
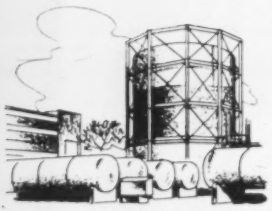


FOR INDUSTRIES

Leading industries use Phillips *66* Philgas successfully for heat treating, mold drying, core baking, ceramic firing and many, many other operations. Automatic Philgas systems assure constant furnace temperatures and atmospheres; constant pressures, high or low.



FOR UTILITIES

Many progressive utilities use Phillips *66* Philgas to augment natural or manufactured gas. High-quality Philgas is uniform in thermal value and gravity, and is free from harmful contaminants. Automatic operation cuts down on overhead.

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Phillips 66

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Only with B. F. Goodrich grommet belts can you make these savings!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give 3x more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

". . . within a few days ordinary belts had stretched . . . After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all . . ."

"Ordinary belts lasted only 5 or 6 weeks . . . B. F. Goodrich grommet belts are in their sixth month of service . . ."

"Previous belts suffered from shock loads, wore out fast . . . BFG grommet belts have been in service 2 years with no shut-downs . . ."

There are hundreds of cases like these.

They cost no more

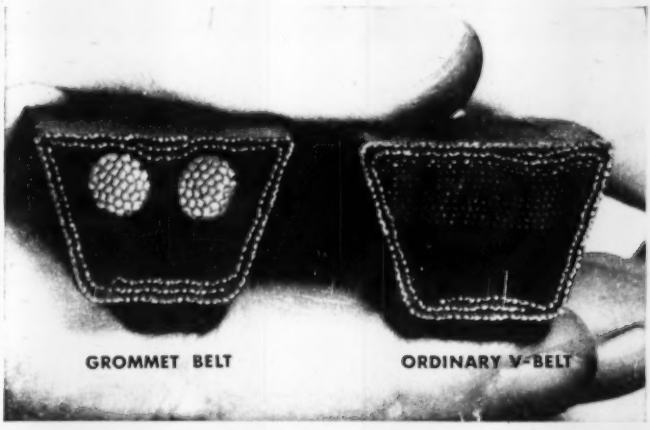
BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V Belts BY

B.F.Goodrich

FIRST IN RUBBER



The B. F. Goodrich Company
Dept. S-9
Akron, Ohio

☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

Name_____

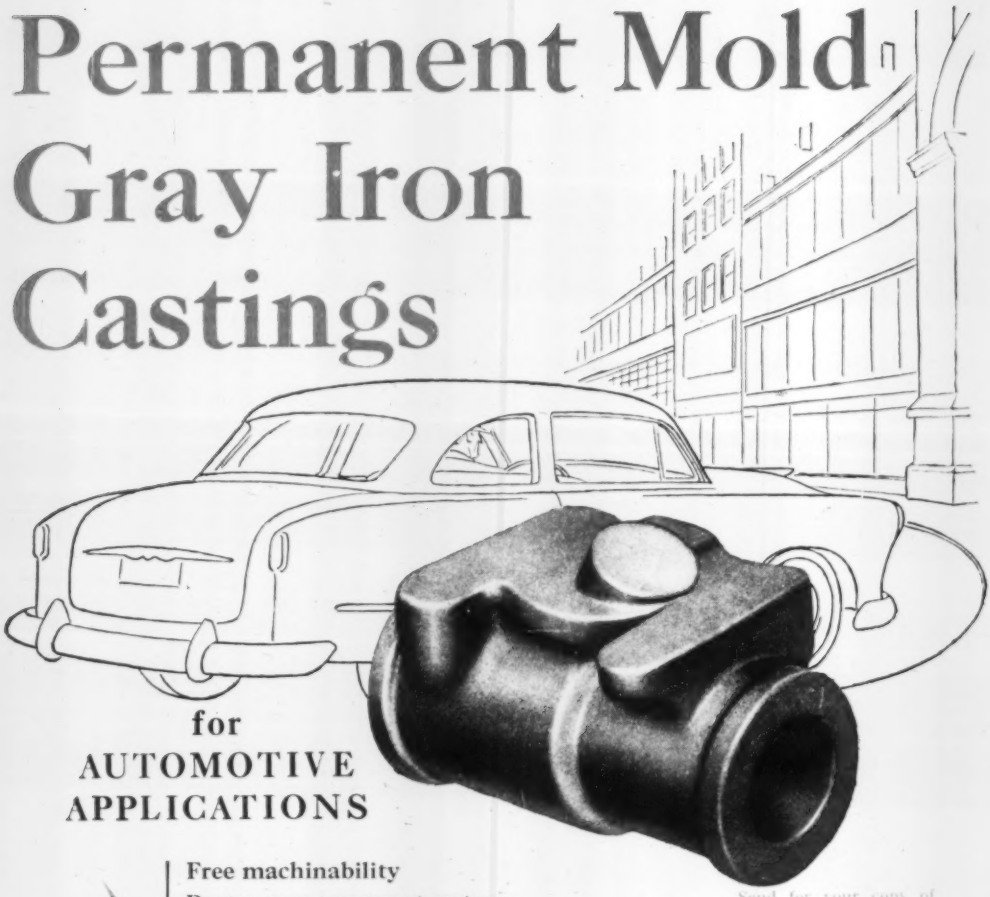
Firm Name_____

Street Address_____

City_____

State_____

Eaton Permanent Mold Gray Iron Castings



for AUTOMOTIVE APPLICATIONS

- Free machinability
- Dense, non-porous structure
- Uniform structure throughout the casting
- Freedom from leakage under pressure
- Machines to high, mirror-like finish
- Properly annealed; no growth or distortion after machining

Send for your copy of the illustrated booklet, "A Quick Picture of the Eaton Permanent Mold Process for Producing Gray Iron Castings."

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STEEL
The Weekly Magazine of Metalworking

VOL. 129 NO. 10 SEPTEMBER 3, 1951

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Editorial and Business Staff—Page 10. Advertising Index—Page 180. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Next Week **... Cultivating the Know-How of Jet Engine Manufacture ... Thorough Washing Insures Clean Cylinder Heads ... ...High Speed Heating and Forging Expedites Hinge Production ... Radioactive Tracers Aid Blast Furnace Research**

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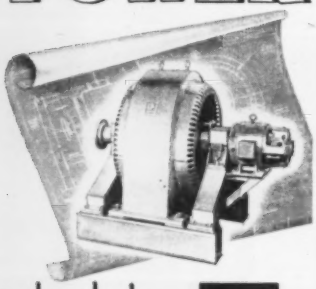

look to... EP

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X-74

Behind the Scenes . . .

Professor Shrdlu Holds a Quiz

Want to test your industrial I.Q.? Here's your chance—Professor Shrdlu's semiannual quiz. Listed below are ten questions dealing with recent developments affecting metalworking, all covered in the Aug. 20 or Aug. 27 issues of STEEL. Jot down your answers on a post card and send it in. Any grade of 90 or better wins our honorary B.T.S. degree, complete with sheepskin.

1. From July 1, 1950, to May 31, 1951, what state had the top dollar volume of government prime contract awards?
   a. Michigan
   b. California
   c. New York

2. National Production Authority and Defense Production Administration together employ how many?
   a. 5500
   b. 13,400
   c. 22,000

3. No. 430 stainless steel contains per cent chromium.
   a. 10
   b. 17
   c. 24

4. is chief of the newly created Industry Branch, Metalworking Equipment Division, NPA.
   a. Oscar Chapman
   b. Jess Larson
   c. Paul W. Norris

5. Machine tool builders, under a revision to CPR 30, can now boost prices per cent above base period ceilings.
   a. 9
   b. 12
   c. 15

6. STEEL's ingot operating rate dropped to 98 in the week ended Aug. 25 because of railroad labor troubles in
   a. Buffalo
   b. Chicago
   c. Kalamazoo

7. Advice from a grinding wheel manufacturer: When grinding is wet, the grinding zone should be
   a. All wet
   b. Damp
   c. Dry

8. Stretch forming as a method of forming sheet metal and extrusions is being relied upon increasingly by manufacturers.
   a. Tank
   b. Truck
   c. Aircraft

9. The subcommittee of the House Small Business Committee is investigating CMP.
   a. O'Mahoney
   b. Burton
   c. Celler

10. Prestressed concrete required only about per cent as much steel as comparable structural steel buildings and reinforced concrete buildings.
   a. 5 to 10
   b. 15 to 20
   c. 20 to 25

Not Registered

Bob Chew, a space representative for Penton Publishing Co., publisher of STEEL, wanted to make a trip to St. Louis. He teletyped ahead for hotel reservations. He wanted to bring his dictating machine along to dictate reports, so in his teletype message he also asked if the hostelry had a.c. current. A teletype message came back confirming his reservation but regretting that A.C. Current was not registered.

Mr. Allen, Oh, Mr. Al-len

We've often thought that bus drivers really didn't go on cross-country tours via Greyhound during their vacations, that sailors didn't go boating in Central Park when on leave and that mailmen didn't go for long walks in the evening. Now we're not so sure. Our Art Allen who beats a typewriter a good many of his waking hours is responsible for our change of mind. For the last week we have been literally flooded with postcards from Allah Achbar, Achmed Abdullah, Omar the Scentmaker, et al—all pseudonyms of our prolific Mr. Allen who is now on vacation. The postcards are in the form of limericks—meter and rhyme well nigh perfect. Who said writers don't like to write.

Puzzle Corner

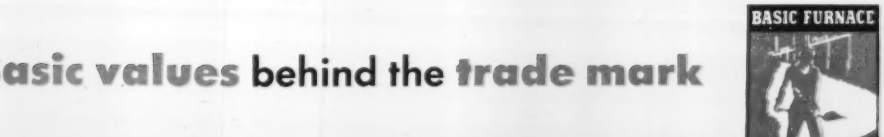
The tube in the Aug. 20 problem is ⅛ inch thick. First in with answers to that were Robert W. Huff of Canton, O., and C. E. Blass of Talon Inc. Incidentally, we inadvertently omitted Mr. Blass' name from among those who had correctly solved the Aug. 6 puzzle about the subway schedule.

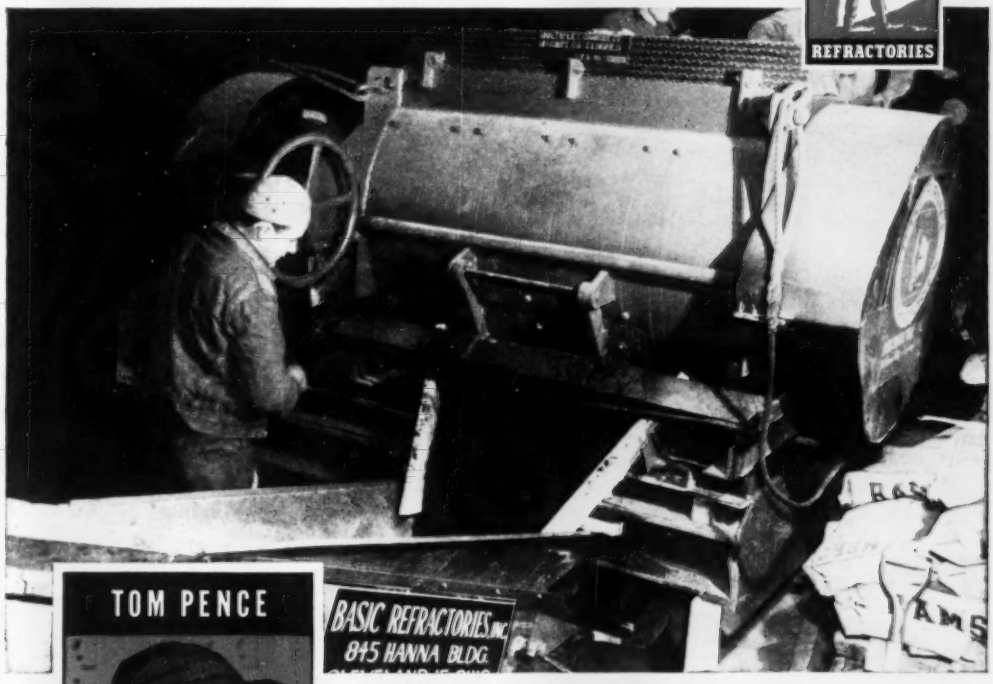
If an army 40 miles long advances 40 miles while a dispatch rider travels from the rear to the front, delivers a message and returns at once to the rear, how far does he travel?

Shrdlu

(Metalworking Outlook Page 51)

Basic values behind the trade mark





Service Division mixer feeds tempered Ramset onto conveyor for delivery OVER charging buggies to furnace.

For years Tom Pence, of the Basic Service Division, has spent most of his time in work clothes on customers' melt shop floors.

SPECIAL SERVICE EQUIPMENT

A FAMILIAR trade mark identifies a dependable product. But quality of product is only one of the values that stand back of the "man with the shovel."

You purchase valuable extras with any of our refractories. On Ramset hearth installations, for example, you benefit from the skilled supervision of the Basic Service Division, *as well as from the use of special mixing, conveying and impacting equipment, available and delivered to your plant.*

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Oct. 15-19 · Detroit, Michigan

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new nitriding process gives you the right START for a faster, low-cost FINISH

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- a minimum "white layer" surface suitable for running-in without after grinding, lapping or superfinishing.
- high fatigue resistance and improved corrosion resistance
- an extremely hard, wear resistant surface
- excellent core properties
- no distortion

The Nitralloy Corporation licenses its exclusive new nitriding process directly to furnace owners and larger users of nitriding steels without limitation as to the source of the steel nitrided. Purchasers of Nitralloy® steels from any of the following licensed steel producers and distributors automatically acquire the right to use the process in converting steel so purchased. Write to them, or directly to us, for complete details of the properties of Nitralloy and the adaptation of your present nitriding facilities to the improved nitriding procedure.

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*Patent No. 2,437,249
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- Automatic gaging, classifying, and segregating machines
- Standard precision gages
- Special gaging equipment
- X-Ray continuous measurement gages

MORE PRODUCTIVE MACHINE TOOLS

- Gear burring, burnishing and chamfering machines
- Micro-Form grinders
- Crushtrue grinding equipment
- Thread and form grinders
- Threading machines
- Automatic welders
- Special machine tools

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- Collapsible taps
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Bundyweld Tubing, double-walled from a single strip. Exclusive, patented beveled edge affords smoother joint, absence of bead, less chance for any leakage.

No need to get yourself out on a catwalk when it comes to choosing a small-diameter tubing for your product.

Bundyweld, the multiple-wall type of Bundy® tubing, is top choice across the boards for applications ranging from radiant heating grids and automotive pressure lines to cartridges of ball-point pens. The only tubing that's double-walled from a single strip, Bundyweld is made by the world's largest producer of small-diameter tubing.

For technical help or information, contact Bundy Tubing Company today.

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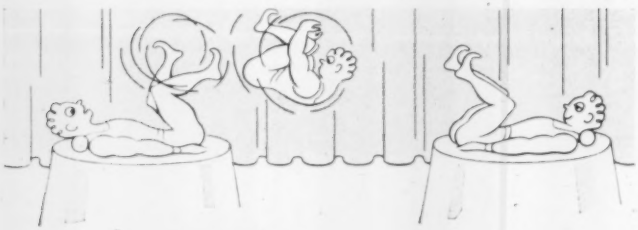
World's largest producer of small-diameter tubing

AFFILIATED PLANTS IN ENGLAND, FRANCE AND GERMANY

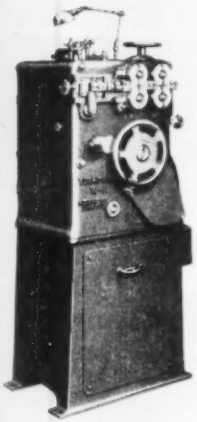


Put some spring in your assembly!

see the man with a

Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.



MODEL W-11 SPRING COILER
The 14 different Torrington Spring Coilers cover a range of wire diameters from .005" to .750".

SPECIFICATIONS
of the Model W-11 Spring Coiler

Wire diameter range: .015" to .072"

Wire Length per Spring: 0" to 42" (Extra Wire Feed Gears Available)

Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive.

Torsion and other attachments are available.

The TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

LETTERS
TO THE EDITORS

Salaries: An Added Check

We read with interest STEEL's item, "Watch Salary Schedules," (July 4, p. 37). Where can we get information in detail on this subject?

B. T. Blauvelt, comptroller
Daystrom Inc.
Elizabeth 8, N. J.

• *Comments were based on observations by Harry H. Rose, Cleveland certified public accountant and tax consultant. Mr. Rose has prepared a letter on tax topics that should supply details you request. Write to Traeger & Rose, 203 Chester-Twelfth Bldg., Cleveland.*

Certificates: Harder To Get

What advice can you offer on advisability of applying for necessity certificates under the fast amortization program?

Charles B. Smith
Smith Pipe & Steel Co.
Phoenix, Ariz.

• *We feel it is definitely to your advantage to try for certificates—but for complete details on the program, contact your nearest Department of Commerce field office. At present the fast amortization program is suspended for 60 days. That means action on only special applications until mid-October. Even then, indications are the government will be far more strict on granting certificates than it has been to date.*

Stud Welding: Its Applications

We are seeking information on stud-welding—particularly on applications of the process and scope of the market for its equipment. Can you suggest a source for this data?

Edward Goldsmith, research director
Aitkin-Kynett Co.
Philadelphia

• *Nelson Stud Welding Division, Morton Gregory Corp., Lorain, O., has a booklet available on stud welding that may answer many of your questions.*

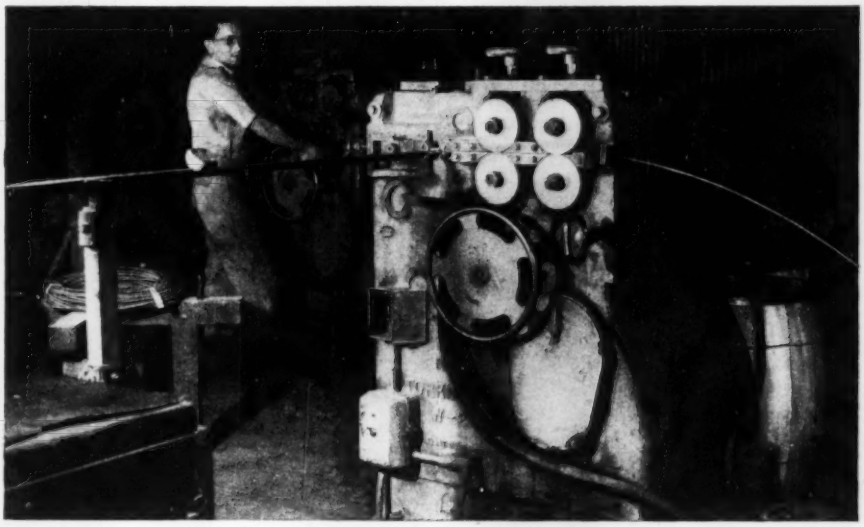
Searching the Files

Several years ago STEEL carried an article by T. M. Keelan, titled "Annealing Cold Rolled Strip." Can you advise the exact issue in which this work appeared?

Societe Anonyme
La Flaminage A Froid
Carnieres, Belgium

• *Mr. Keelan's articles (there were two) appeared Jan. 14, 1938, p. 40 and Feb. 24, 1938, p. 56.*

HIGH CARBON WIRE



Manufacturing control casing with Roebling wire.

Save money with Roebling wire

. . . round, flat and shaped

WHEREVER a manufactured product calls for high carbon steel wire, Roebling wire will bring you top results . . . and help your production, too! Every inch of these Roebling specialty wires is identical in grain, gauge and finish. Your preparation time is lowered; machine stoppages and rejects cut way down. And there's a Roebling round, flat or shaped wire for almost every application.

Roebling's specialty wire plant is one of the largest in America. Today a large share of its output is required in the rearmament program. We assure you, however, that we will always do our level best to fill your orders as required. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

J&L STEEL

SUN MON TUES WED THURS FRI SAT
1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30
SET A Scrap Day IN YOUR ORGANIZATION!

Set a definite day . . . soon . . . to start rounding up all the dormant scrap in your operation. Extra scrap is urgently needed to keep mills at expanded steel production.

Here's what's wanted

Steel producers must have scrap over and above the "working scrap" that you normally sell. Broken or obsolete machinery and equipment . . . odds and ends . . . worn out parts—in fact, *all* the iron or steel material that's rusting away in your plant or operation. Get it out of the way . . . get it on its way into production.

Here's what to do

Set a definite day to start . . . make scrap collection the definite responsibility of one man or one group. Call your scrap dealer. He'll take all the scrap you can collect and pay you well for it.

Set YOUR Scrap Day NOW!

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PA.

EXTRA! LORAIN CRANES Combine Material *Moving* with Material *Handling*

Put a Lorain Self-Propelled Crane on your lifting, loading and storage jobs . . . and use it as a low cost prime mover to shift, move and transport railroad cars and loaded trailers!

Lorain Self-Propelled Cranes are the newest trend in cutting material handling costs. Mobility is unrestricted — they travel anywhere on rubber tires. They will handle materials of any size, shape or type. Long reaching booms permit higher stacking of materials to save yard space. One-man controls travel and lifting operations. Efficiency is tops — at any hour, on any shift, in any season.

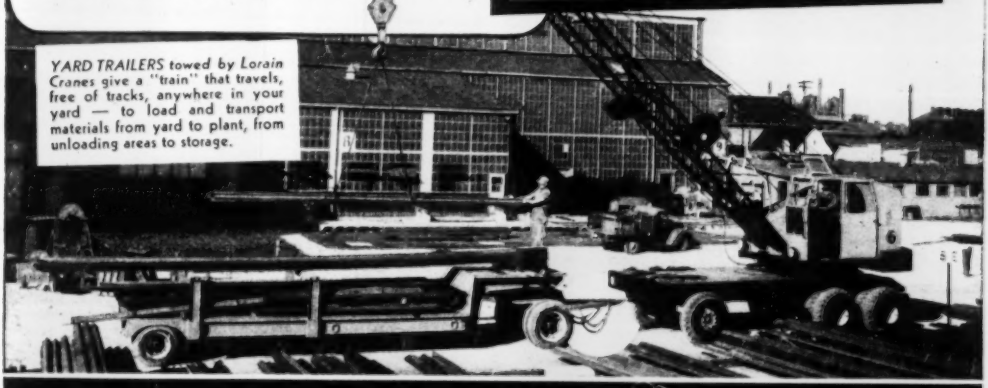
Beyond these regular material handling advantages, it will pay you to consider the extra savings in yard transportation. The Lorain Crane can quickly shift railroad cars anywhere in the yard. The very same Crane can be coupled with loaded trailers to transport them to storage areas, to load them, to transport materials back to the shop.

When you think of Lorain Self-Propelled Cranes, think of the extra, cost-cutting jobs it can handle. For a complete recommendation of the size and type to fit your plant, get in touch with your nearby Thew-Lorain Distributor.

THE THEW SHOVEL CO., LORAIN, OHIO

RAILROAD CARS don't need a locomotive when a sure-footed, Lorain Self-Propelled Crane gears its big tires to the ground. Here, this car is being spotted for unloading . . . and the same Lorain that pushes this load will quickly unload its cargo of coal.

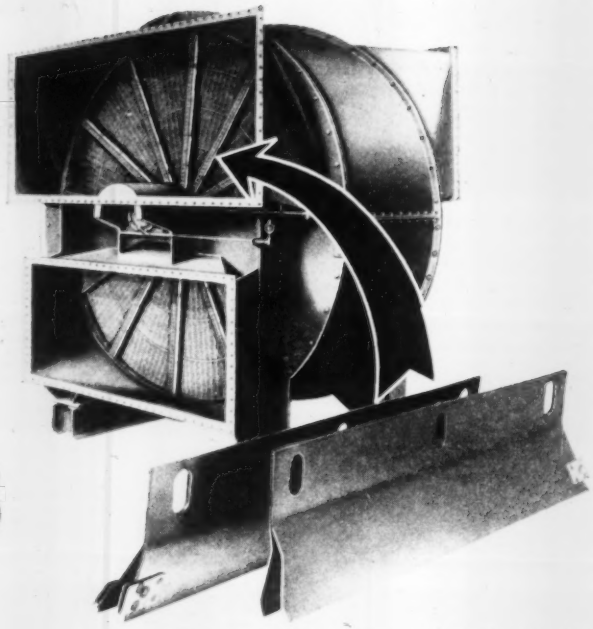
THE SAME *LORAIN CRANE* THAT LIFTS, LOADS and STORES MATERIALS CAN ALSO PUSH AND PULL RAILROAD CARS and TRAILERS!



YARD TRAILERS towed by Lorain Cranes give a "train" that travels, free of tracks, anywhere in your yard — to load and transport materials from yard to plant, from unloading areas to storage.

THEW LORAIN® CRANES FOR INDUSTRY

Eliminates 3 to 6 Costly Shutdowns



In general, corrosion in air preheaters occurs at the seals on the cold end, where corrosive sulphides and chlorides condense from hot flue gases on the cold metal. At this key point, HASTELLOY alloys last 3 to 6 times longer than other metals.

Air Preheater Seals of HASTELLOY Alloy Last 1½ to 2 Years in Presence of Sulphides, Chlorides, and Metallic Compounds

Use of preheated air has resulted in considerable savings at several refineries where HASTELLOY alloy has helped to eliminate the severe corrosion problem often encountered at the cold end of the preheater units. The radial, circumferential, and post seals ordinarily used in this service leak and overload blower motors after only 3 to 6 months because of the corrosive flue gases, which condense when they strike the cold metal. Before the refineries switched to HASTELLOY alloy, maintenance and replacement costs frequently canceled out much of the saving in fuel consumption and other advantages of reclaiming waste heat from most reaction processes.

Seals made from HASTELLOY alloy are not readily attacked by the refinery gases, which usually contain sulphides and chlorides, as well as compounds of vanadium, arsenic, and other metalloids and metals. Equipment can be run continuously for as long as 18 months to 2 years without shutdown for the replacement of seals.

For complete data on HASTELLOY alloys, write for the 40-page booklet, "HASTELLOY High-Strength, Nickel-Base, Corrosion-Resistant Alloys."

HAYNES TRADE-MARK *alloys*

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles — New York — San Francisco — Tulsa

"Haynes" and "Hastelloy" are trade-marks of Union Carbide and Carbon Corporation.

This material gives us entire satisfaction and its production will be four times greater than the estimated output guaranteed by your contract.
ETABLISSEMENTS CHARLES COQUILLARD
ALUMINIUM MINCE
LAMINAGE BY TRANSFORMATION
HYDROPRESS, Inc.
570, Lexington Avenue 570
NEW YORK 22 (N.Y.)
Gentlemen:
We ordered from you, in February 1948, an installation for the rolling of aluminum strips and thin foil:
Width..... 1,000 mm (40")
Thickness.... 9/1000 (.00035")
Weight..... 1,200 kg (2650 lbs.)
Speed..... 1,000 m/min. (3280 ft./min.)
We are pleased to advise you that this complex material, received in June 1950, was put into operation in November 1950, after having been erected by ourselves without great difficulty.
This material gives us entire satisfaction and its production will be four times greater than the estimated output guaranteed by your contract.
We authorize you to make use of this attestation.
Please accept, Gentlemen, the expression of our kindest regards.

LOEWY HIGH SPEED ROLLING MILLS

FOR STRIP AND FOIL

- *speed more than 3000 FPM*
- *designed for one-man operation*
- *extremely sensitive tension & temperature control*

We were the first designers of High-Speed Foil Mills in 1945. Since then many details of our design have been greatly improved and tested in actual production.

We supply complete Rolling Mill Installations and the specialized Auxiliary Equipment that is indispensable for high-speed production of foil and other strip material to accurate gauge.

Four-High Cold Strip Mill For Roughing Aluminum Foil. A part of the High-Speed Cold Rolling Mill Installation for the production of aluminum foil 42" wide and .00025" thick supplied to Etablissements Charles Coquillard, France.

LOEWY ROLLING MILL DIVISION

HYDROPRESS INC

ROLLING MILLS AND ROLLING MILL EQUIPMENT

566 Lexington Avenue General Electric Bldg. at 51st Street **New York 22**

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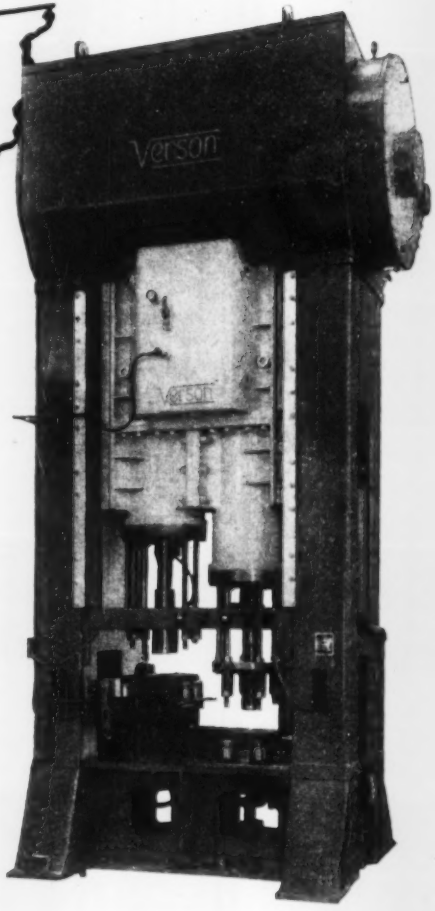
Can you match these production figures?



THIS TRADE Verson MARK AUTOMATIC TWO STAGE THREE OPERATION DRAWING PRESS produces over 1200 shells per hour

Typical of how Verson presses are advancing the efficiency of press forming of metals is the automatic two stage three operation drawing press illustrated above. 4½" I.D. x 7¼" deep shells are drawn at the rate of 1200 per hour! A completed shell is discharged at each stroke.

Presses such as this are typical of the many unusual machines being produced by Verson. But whether your job is unusual or conventional, it will be of interest to you to learn how Verson's extensive experience and know-how as a manufacturer of better presses for most jobs can help you.

Whatever your press requirements, whether they call for a single machine or a complete tool-up, call on Verson.

At the right is the finished shell after the final drawing and setting operation. Drawn from 21 ga. stock, the dimensions are 4½" I.D. x 7¼" deep.

Originators and Pioneers of Allsteel Stamping Press Construction

VERSON ALLSTEEL PRESS COMPANY

9318 South Kenwood Avenue, Chicago 19, Illinois — So. Lamar at Ledbetter Dr., Dallas 8, Texas

A VERSON PRESS FOR EVERY JOB FROM 60 TONS UP!

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING
DIE CUSHIONS • COMPRESSION AND TRANSFER MOLDING PRESSES

"YOU CAN'T BEAT READING COPPER TUBING FOR UNIFORM HIGH QUALITY AND FAST, SURE DELIVERY!"

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READING TUBE CORPORATION

Producers of Reading Lektroneal Copper Tubing and Reading Brass Tubing

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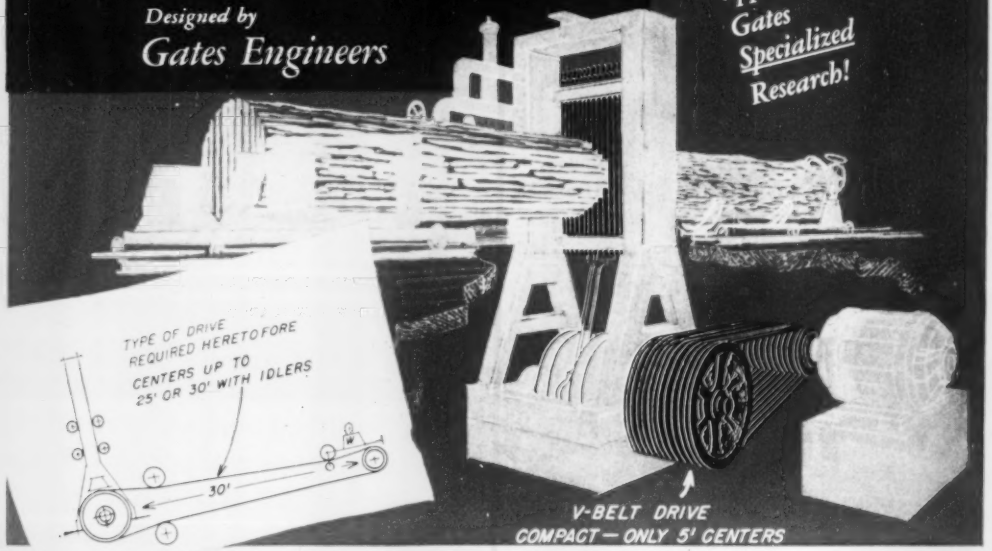
The first successful V-Belt Drive for GANGSAWS

Designed by
Gates Engineers

Another practical application of Gates Specialized Research!



A large maker of gangsaws said to Gates Engineers, "If you can design a V-Belt drive to handle the *fluctuating load* on a gangsaw, we can discard the long and troublesome flat belt that we have always thought we had to use."

The *reasons* for his statement are quickly told:—

A gangsaw (or Swedish type Gang Mill) consists essentially of several saw blades mounted in a heavy steel frame or "sash" that moves rapidly up and down like a monster jig saw. This sash may weigh a ton or more—yet it makes about *five* 24-inch *up* and *down strokes per second!*

On the *up* strokes, the saws have no cutting load on them. But on the *down* strokes they must often slash a log up to 36" diameter into 2" planks. This great unbalance in load between the *up* and the *down* strokes has heretofore defeated all efforts to apply a V-Belt Drive to saws of this type.

After thoroughly analysing the fluctuating load on gangsaws, Gates Engineers recommended very minor changes in design which would permit the application of V-Belts and—what is of *utmost importance to you*—they were able to write down *in advance* the exact specifications of the V-Belt Drive that has very successfully handled this extremely difficult assignment.

This *pre-solution* of drive design problems is possible because Gates operates the largest V-Belt testing Laboratories in the World—and Laboratory findings are carefully checked by tests made under actual field conditions. Finally, the *results* of these exhaustive tests are immediately reduced to *usable data* for the design of V-Belt drives to *perform whatever task may be required.*

Phone a Gates Field Engineer

If you have a difficult drive to design, or if some drive in your plant is giving trouble, or if you only want to be sure what size and construction of V-Belts will give the most efficient and the lowest cost service on any particular drive—you have only to phone a Gates Field Engineer, *always near you* in all industrial centers.

Just look in your phone book under "Gates Rubber." A Gates Field Engineer will come right to your plant and put at your service the full benefits of Gates V-Belt knowledge and experience *without the slightest obligation!*

ENG. 515

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Hose V-Belts
Molded Rubber Goods
for Industry

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ENGINEERING OFFICES AND JOBBER STOCKS
IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY
DENVER, U. S. A.
The World's Largest Makers of V-Belts

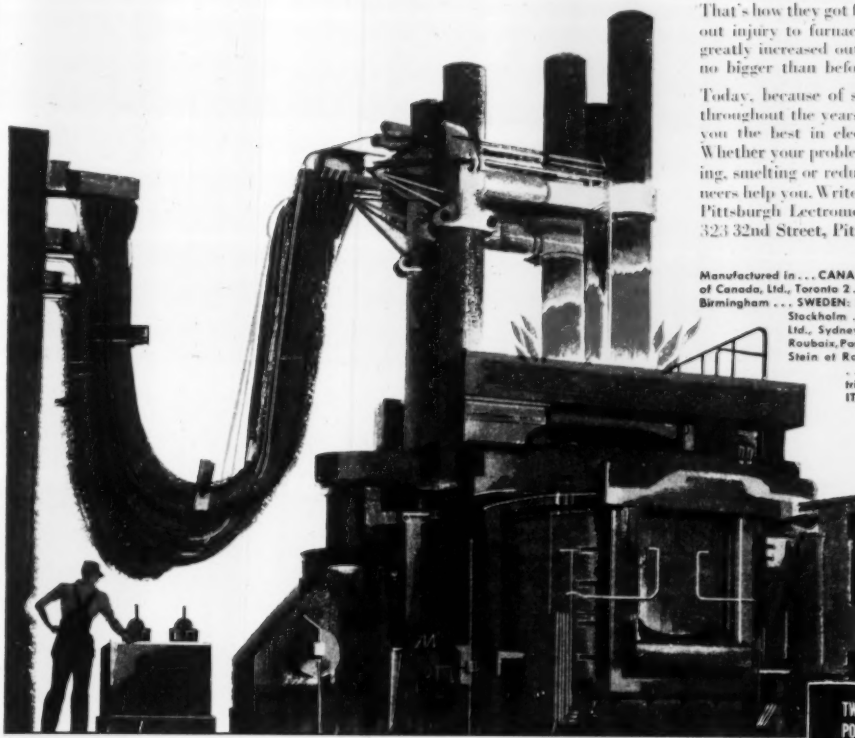
THEY THOUGHT IT COULDN'T BE DONE

but Lectromelt doubled electric furnace production by doing it!

Other electric furnace designers said it couldn't be done. But Moore, inventor of the Rapid Lectromelt Furnace, dared to boost the power fed to arcs. Production zoomed as power input was pushed up. The day's work was doubled.

Lectromelt heavied up their construction generally, provided larger transformers and power leads, micro-accurate electrode control and more efficient cooling. That's how they got faster melting without injury to furnaces or charges, and greatly increased output from furnaces no bigger than before.

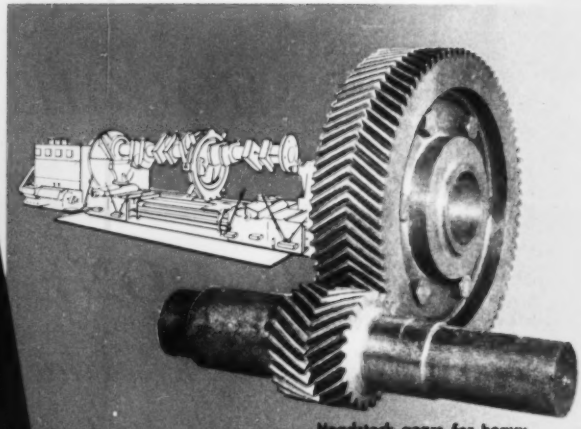
Today, because of such bold thinking throughout the years, Lectromelt offers you the best in electric arc furnaces. Whether your problem is melting, refining, smelting or reduction, let our engineers help you. Write for Bulletin No. 7, Pittsburgh Lectromelt Furnace Corp., 323 32nd Street, Pittsburgh 30, Penna.



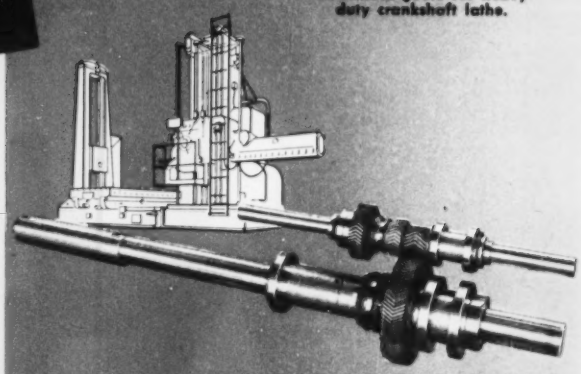
Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . SWEDEN: Birlec Elektrougnar A/B, Stockholm . . . AUSTRALIA: Birlec, Ltd., Sydney . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S.A. Belge Stein et Roubaix, Brassoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa.

WHEN YOU MELT... MOORE RAPID *Lectromelt*

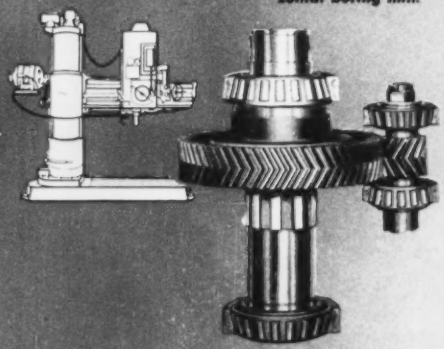
WHEN PRECISION IS VITAL *specify* Farrel Gears



Headstock gears for heavy duty crankshaft lathe.



Gears for driving main and auxiliary spindles of a horizontal boring mill.



Spindle gears for a radial drill.

In many machine tools, *where accuracy is of primary importance*, Farrel herringbone gears are used to transmit a smooth, efficient flow of power to work or tool point.

The quiet, vibration-free performance and long life you can expect from these gears result from extreme accuracy of tooth spacing, contour and helix angle, and other qualities inherent in the Farrel-Sykes method of gear generation. They are made of the finest grade materials, in a complete range of sizes for any power capacity and any application.

Wherever power transmission must be smooth and vibrationless under all conditions of load and speed, *specify Farrel herringbone gears*. Information and engineering assistance available, without obligation.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Cleveland, Detroit, Chicago, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

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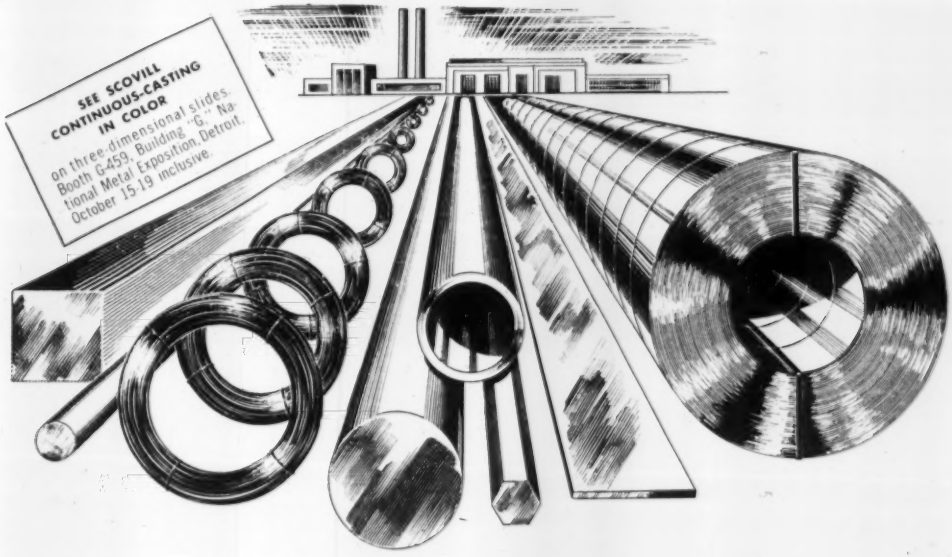
FB-698



You get more from Scovill brass because it's continuous-cast!

Waste is minimized when you use Scovill Brass Mill Products.

That's because of Scovill's leadership in the development and commercial production of *continuous-castings* in America. Since 1938, about one billion pounds of brass billets and bars have been continuous-cast by Scovill.

From continuous-cast billets or bars are derived Scovill Brass Mill Specialties of outstanding importance to the metalworking industry. These include:

Strip and Sheet Brass
(Copper-Zinc Series)
High Speed Brass Rod
(Free Cutting)
Extruded Cold-Heading Wire
(Cartridge Brass, 70%)
Phosphorized Admiralty Condenser Tube
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(Alloy No. 284)

All of these outstanding Scovill Brass Mill Products have as their unique continuous-casting advantages:

1. **Uniformity of Chemical Composition:**
Minimum variation of all alloying elements from lot to lot . . . minimum presence of impurities . . . elimination of any type of element, compound or phase segregation.

2. **Inherent Soundness:**
Uniformity of basic cast structure . . . freedom from damaging subsurface blisters, spills or dirt . . . absence of weaknesses caused by intercrystalline shrinkage . . . elimination of porosity.

"You Can't Buy Better Brass" than Scovill brass, though under present conditions you may have to accept restricted allotments. Scovill prepared for increased demand after World War II by building the world's most modern Continuous Strip Mill and modernizing other existing mills. But today's raw material shortages (copper, zinc, etc.,) are beyond Scovill's control, while demand continues at an all-time high.

When you do get Scovill *continuous-cast* Brass Mill Products, you'll see how they go further.

"You can't buy better brass"

SCOVILL

A PRODUCT OF SCOVILL

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BRASS MILL PRODUCTS IN A COMPREHENSIVE RANGE OF COMMERCIAL ALLOYS, SHAPES, TEMPERS AND SIZES

ELECTRO-PLATERS COMPANY OF MILWAUKEE

relies on *GAS*

for Efficient, Economical Electro-Plating

Important factors in the success of the production line technique of plated parts at Electro-Platers Co. are the GAS-fired immersion burners used to heat plating solutions to proper temperatures.

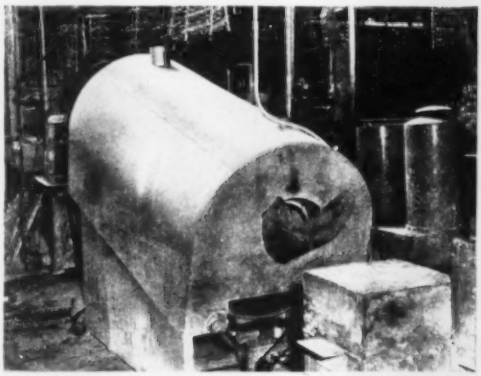
Such diverse items as hub caps, oven door handles, hardware, and dairy industry cylinders are plated in tanks containing Gas-heated solutions. Tanks are fired by Surface Combustion Corporation's 6″ atmosphere burners on immersion tubes. The bulk of the plating is Copper, Nickel, Chromium, Cadmium, and bright Zinc.

ADVANTAGES OF GAS

- **Precise temperature controls maintain exact temperatures.**
- **GAS immersion burners require virtually no maintenance.**
- **GAS burner operation has proved itself economical.**

Throughout Industry, the numerous applications of GAS demonstrate the versatility, economy, simplicity, and efficiency of GAS as an Industrial Fuel. Your local Gas Company Representative can give you the facts about GAS and the advantages of GAS in your production line. Call him today.

Gas immersion burners (at bottom of plating tanks) accurately maintain required plating solution temperatures at Electro-Platers Company, Milwaukee, Wisconsin.



Gas-heated rotary-parts dryer speeds production.

MORE AND MORE . . .
THE TREND IS TO GAS
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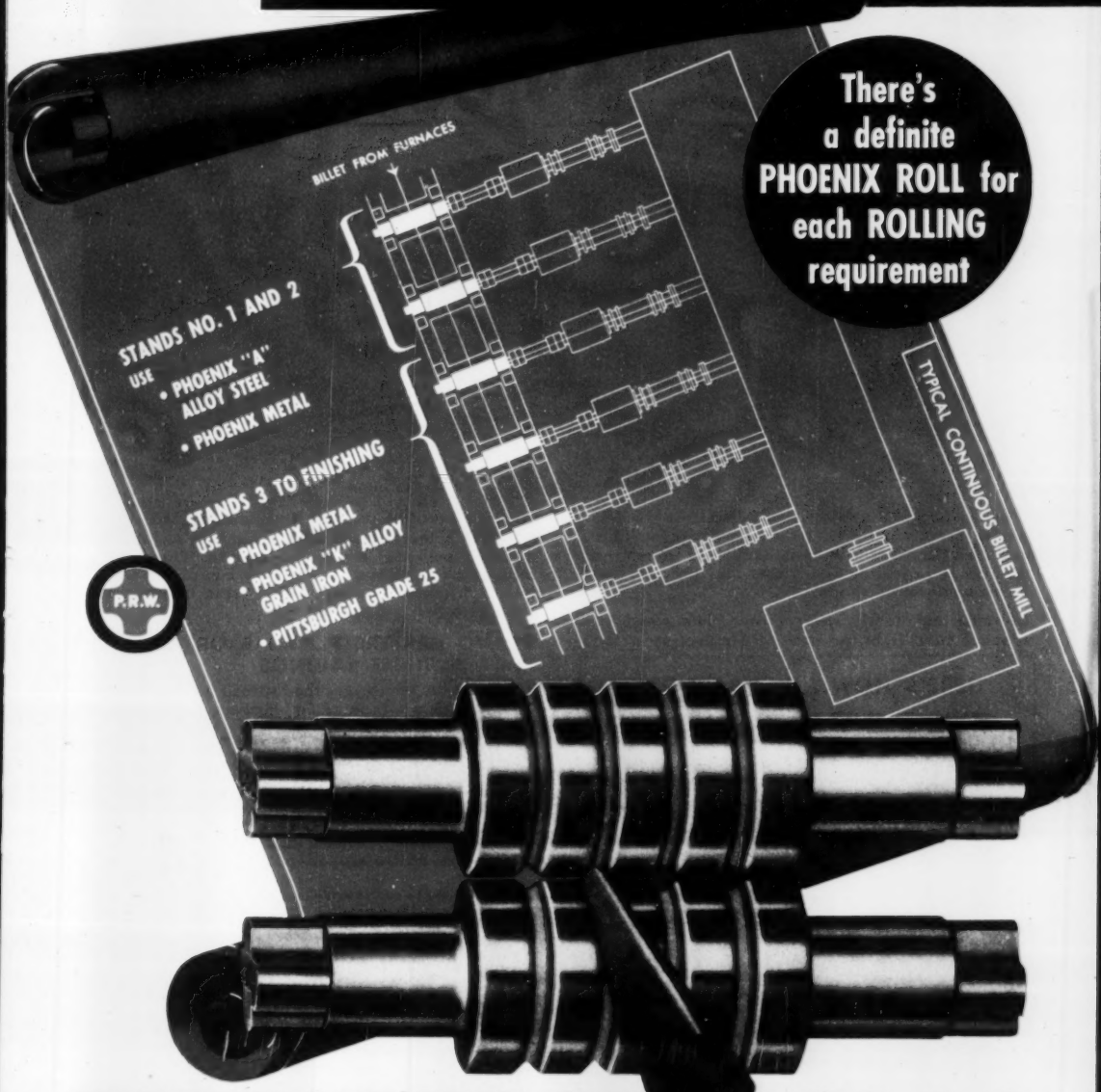
ROLLS for ROLLING BILLETS



PITTSBURGH ROLLS

PITTSBURGH ROLLS DIVISION OF BLAW-KNOX COMPANY • PITTSBURGH, PA.

HOW DRAVO *Counterflo* HEATERS

*helped a large eastern railroad**

save $159,000.

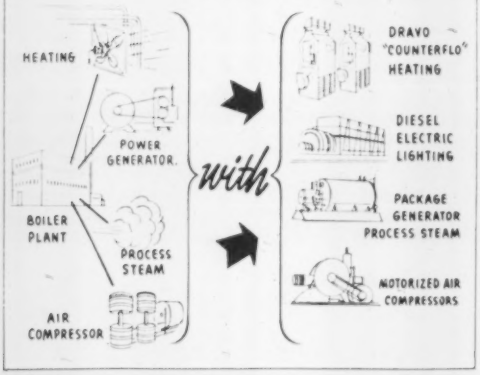
IN ONE YEAR

*Customer's name withheld on request.

When a large eastern railroad dieselized its locomotive fleet, it not only reduced its road operating expenses, but found substantial savings in an improved method of providing heat, light and process steam for its reconverted shops.

By replacing the old steam power plant which had supplied heat, light, power and compressed air at a cost of $208,600 per year (not counting fuel transportation), the railroad now obtains its utilities for $48,676 per year at this installation. The savings offset the total investment in new equipment in ten months! Savings for the second year of operation amount to nearly $160,000.

HERE'S HOW...IT WAS DONE
THIS RAILROAD REPLACED...



DRAVO HEATERS PLAY MAJOR PART IN THESE SAVINGS

These are the advantages the railroad gained through the use of Dravo "Counterflo" Heaters:

- . . . low initial cost . . . savings up to 60% on installation
- . . . concentration of heat at working level
- . . . 150 foot air throw . . . no duct work required
- . . . flexibility . . . units can be mounted in any position, floor, wall or ceiling
- . . . burn gas or oil . . . readily converted . . . low fuel consumption
- . . . automatic control . . . on-off or modulating controls
- . . . long service life, low maintenance . . . stainless steel combustion chamber
- . . . mobility: can be moved easily to any location

Versatile Dravo Heaters are used in nearly every type of industrial installation.

"Counterflo" Heaters are ideal for commercial and industrial use in foundries . . . warehouses . . . machine shops . . . stores . . . schools . . . churches . . . process industries . . . any many others. Why not look into the possibilities of Dravo Heaters for your heating and ventilating needs? Write today for Bulletin No. OP-52 -6879.

DRAVO CORPORATION

HEATING DEPARTMENT, DRAVO BUILDING, PITTSBURGH 22, PA.

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FINKL MO-LYB-DIE Precessed Die Blocks are made from steel developed by Finkl to answer the needs arising from drop forging problems. Their inherent toughness, resistance to heat checking and washing, high resistance to abrasion, and good machinability are the combinations that give you more forgings per impression and more impressions per die.

The MO-LYB-DIE trademark on a die block is a guarantee that the utmost care and attention have been given to forging, heat treating and testing operations. Learn for yourself—specify Finkl die blocks and get impressions that last.

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Advertisement

ELECTROMET *Data Sheet*

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

MANGANESE . . .
Deoxidizer and Toughener for Steel

Manganese is one of the most important alloys used in making steel. It is practically indispensable as a deoxidizer and cleanser for improving the hot-working properties of steels. When used as an alloying element, it makes steel stronger and tougher and it is therefore an important constituent of many structural and engineering steels.

Deoxidizes and Cleans Steel

The effectiveness of manganese in deoxidizing steel was first recognized in 1856, when it was used in the Bessemer process of steelmaking to counteract the bad effects of sulphur; in fact, manganese made this process a commercial success. Today, manganese is used as a deoxidizer and cleanser in the production of nearly all grades of open-hearth and electric-furnace steel, as well as high-grade cast iron.

Research work carried out recently in ELECTROMET'S laboratories at Niagara Falls, New York, has provided new and important information on the value of manganese as a deoxidizer. This work shows that manganese is a more effective deoxidizer than has been previously realized, and that a combination alloy of silicon and manganese is a much stronger deoxidizer than either silicon or manganese by itself. Complete information is given in a report entitled "Solubility of Oxygen in Liquid Iron Containing Silicon and Manganese." If you would like a copy of this report, free of charge, write to the address above.

Improves Hot-Working Properties

By combining readily with sulphur, manganese performs another valuable job: it removes the principal cause of hot-shortness or brittleness, thereby giving steel better rolling and forging properties. In this reaction, the manganese combines with the sulphur to form manganese sulphide, as follows:

$$Mn + FeS = MnS + Fe$$

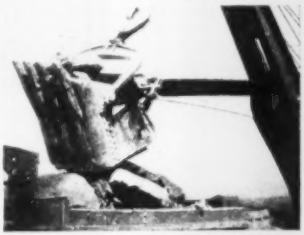
The manganese sulphide remaining in the steel is a less harmful type of inclusion than the iron sulphide would be, the hot-working properties of the steel are improved.

The weakening and embrittling tendencies of sulphur in cast iron can also be counteracted by the addition of manganese to the cupola charge.

Increases Strength, Toughness, and Wear-Resistance

When used as an alloying element in steel, manganese produces a steel with greater strength and toughness, and there is no serious loss of ductility. Additions of about 1.5 per cent manganese produce the well-known Hadfield manganese steel. High-manganese steels have exceptional resistance to wear; and consequently they have many applications in engineering jobs. Instead of wearing away quickly under conditions combining severe pressure, shock, and abrasion, these steels actually become harder through use. Thus, they last longer.

Because of the tendency of high manganese steels to work harden, they serve industry in important and varied applications. Manganese steel castings, for example, are used for railroad frogs and crossings, rock-crusher parts, steam-shovel dipper teeth, and dredge-bucket lips. The chief applications of manganese steel are in rails used for special service, and light forgings subjected to heavy wear.



Dipper bucket teeth, cast of Hadfield manganese steel, actually increase in hardness under abrasive wear from gravel and rock in construction work — thus last many times longer than those of ordinary steel.

ELECTROMET Alloys

Manganese is produced by ELECTROMET in forms suitable for practically every use of the iron, steel, and non-ferrous metal industry. Some of the ELECTROMET products are listed below. For a complete description of these alloys, write for a copy of the booklet, "ELECTROMET Products and Service."

The terms "EM" and "Electromet" are registered trade-marks of Union Carbide and Carbon Corporation.

Alloys of Manganese and Their Uses

Standard Ferromanganese	The product most commonly used for adding manganese to steel for the purpose of alloying or deoxidizing and cleansing.
Low-Carbon Ferromanganese	For adding manganese to steels having a low carbon content, such as stainless steels of the 18 per cent chromium, 8 per cent nickel type.
Medium-Carbon Ferromanganese	Commonly used for making manganese steel containing 1.50 to 2.00 per cent manganese, and in the production of Hadfield manganese steel.
Low-Iron Ferromanganese	For applications in the nickel, aluminum, and copper industries where a low-iron alloy is required.
Silicomanganese	Used by the steel industry as a furnace block; as a deoxidizer; and also for manganese additions, particularly in the production of engineering steels containing 0.10 to 0.50 per cent carbon.
"EM" Silicomanganese Briquets	For adding manganese (with silicon) to cast iron in the cupola.
"EM" Ferromanganese Briquets	For adding manganese (without silicon) to cast iron in the cupola.

Strong fibres start here

When these logs are pulled up the chute toward the chipper they are taking the first step toward becoming a Gaylord Shipping Container.

Throughout the entire complicated procedure of converting wood into paper — sharp-eyed technicians are constantly checking quality, making adjustments, testing to be absolutely sure that the end product is as strong and tough as it is possible to make it.

This quality control by experts is one reason why Gaylord lists many of the world's largest users of shipping containers among their satisfied customers.

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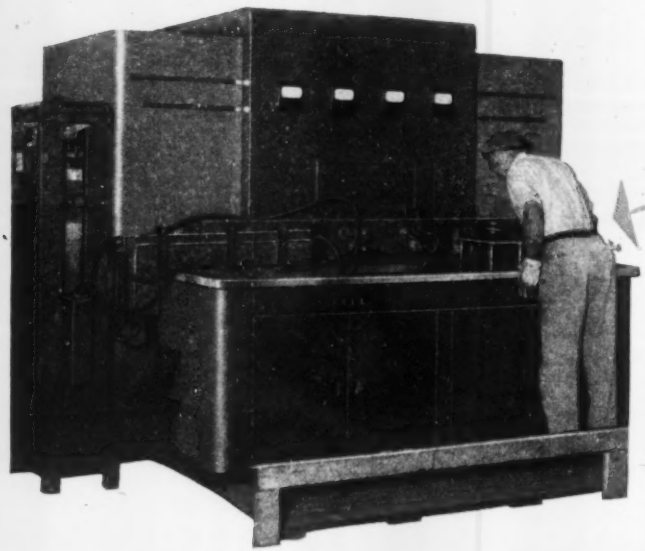
HOT FORMULA!

RF = LC + BP − R



Puts The Heat On Parts Production at Oliver

RF = LC + BP — R means: Radio Frequency heating equals Lower Costs plus Better Product minus Rejects . . . and here's how this formula paid off for the Oliver Corporation, Charles City, Iowa.

Oliver needed a heat treating process flexible enough to handle 15 different parts, ranging from ½ inch sleeves, lever arms and valve seats to long shafts. The hardening operation, requiring as many as 10 daily set-ups, had to supply varied parts of consistently high quality, or production would be delayed.

Oliver installed a 50 KW-450 KC RF Generator and work-handling equipment, all Westinghouse-built, which easily handled all parts, and required only about 10 minutes of an unskilled operator's time for changing set-ups. The RF induction heating process drastically cut costs 45%, and there were *no* rejects—with the net result that Oliver is able to produce a better tractor faster and cheaper.

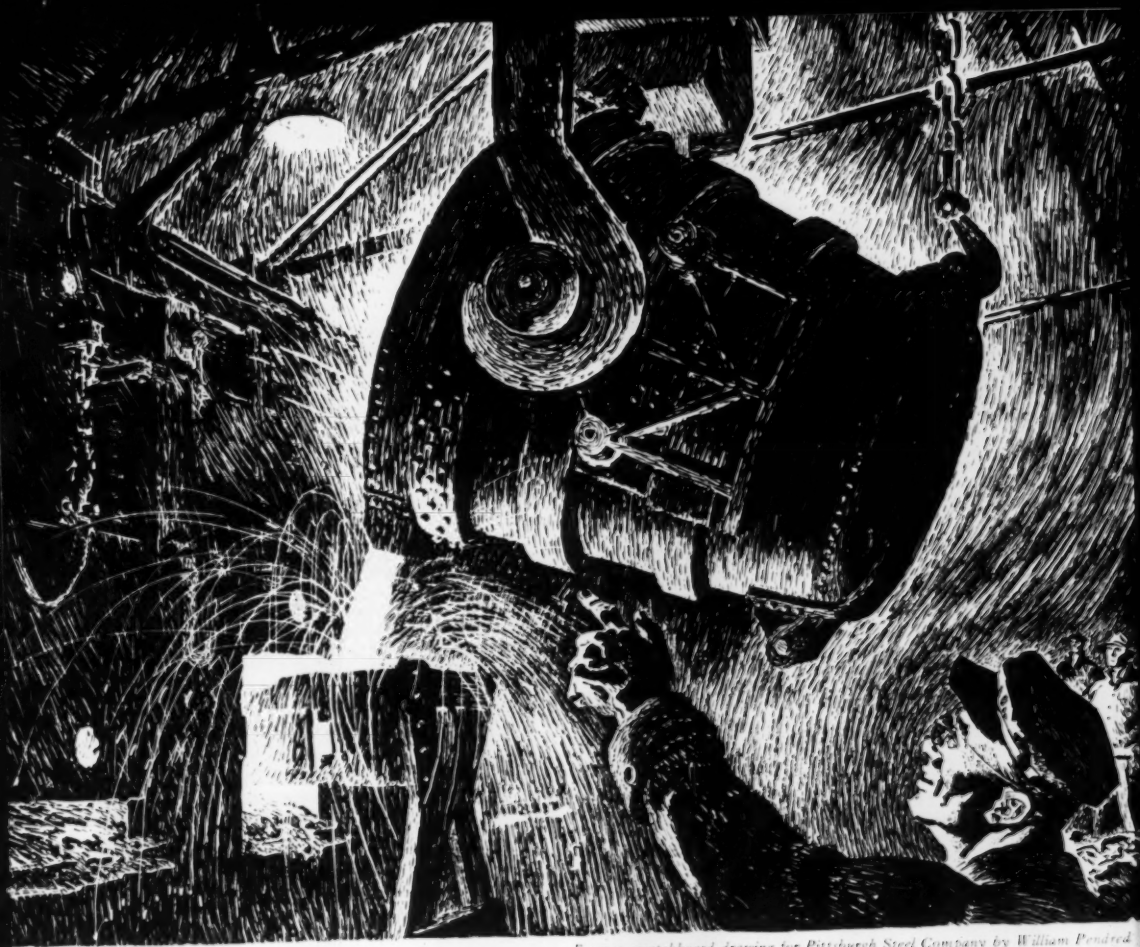
See how this formula—or one of its many variations—has solved the heating problems of other manufacturers—problems that may parallel your own. Write for case history booklet, B-4782, Westinghouse Electric Corporation, Dept. S22, 2519 Wilkens Avenue, Baltimore 3, Md.

J-09250

YOU CAN BE SURE...IF IT'S

Westinghouse

INDUCTION HEATING



Charging an Open-hearth *From a scratchboard drawing for Pittsburgh Steel Company by William Pendred*

Progress in Steel

Progress at Pittsburgh Steel Company is being measured by the ton these days as the expansion program inaugurated last year moves steadily toward its goal of increasing the company's steel making capacity by fifty percent.

This Program of Progress is designed to add a half-million tons of vital steel capacity to the might of the Nation. It will also enable Pittsburgh Steel to add strip and sheet to its long established line of wire and tubular products and better serve all its customers.

In order to make this substantial increase in capacity, provision has been made to feed more raw material to the company's towering blast furnaces which are also being re-equipped to produce more of the iron from which steel is made.

In turn, the Pittsburgh open-hearth furnaces, each of them bigger than a ten room house, are being rebuilt and enlarged. Soon the increased flow of iron will be charged as shown above into the roaring, white-hot interior of these giants and converted into a greater abundance of steel. This extra steel will help supply the demand of the new blooming-slabbing mill now under construction which will roll steel for the new strip-sheet mill and other finishing mills.

Despite all the material things this extra half-million tons of steel represents, it signifies something much greater. It is tons of progress—a practical demonstration that Pittsburgh Steel Company and the rest of the industry are pacing the demand for more steel to benefit all who live in the free world.

Pittsburgh Steel Company

Pittsburgh, Pennsylvania

GOULD

Plus-Performance Plan

...SHOWS YOU HOW ACCURATE RECORDS

LENGTHEN BATTERY SERVICE!

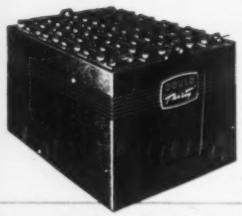
Keeping of accurate records is vital to the conservation and extension of essential battery power. The GOULD PLUS-PERFORMANCE PLAN makes the keeping of battery records easy by providing you with full information on how to test your batteries, and charts and forms for recording test data.

This timely plan puts at your disposal a complete system of manuals, articles, specifications, bulletins, charts, graphs and forms explaining and illustrating how to select, charge and handle, maintain and determine the condition of your batteries. This material, which can increase battery service as much as 50%, is FREE to battery users, without obligation. A request on your letterhead will bring descriptive booklet by return mail.

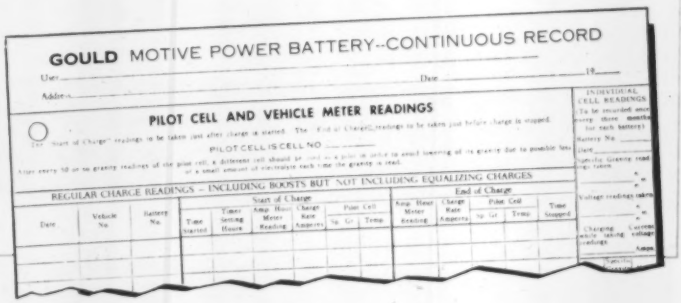
DAILY RECORD SYSTEM CONTROLS BATTERY MAINTENANCE

Number each battery and, as each is installed, read and record its specific gravity and temperature on chart illustrated below (these charts are FREE on request to users of the GOULD PLUS-PERFORMANCE PLAN). Record also, date each battery is put into service, and vehicle to which each is assigned. When each battery is charged, specific gravity, temperature, time, setting of ampere-hour meter and the date and amount of water are recorded.

Such a record tells 1) whether batteries are fully charged when placed in service; 2) number of hours each battery was in service; 3) if batteries were discharged below normal value; 4) whether batteries are being properly charged; 5) when batteries should be changed to prevent overworking and resultant failure during shift.



The GOULD "Thirty" with "Z" PLATES—
America's Finest Industrial Truck Battery



GOULD MOTIVE POWER BATTERY--CONTINUOUS RECORD

User _____ Date _____ 19____

Address _____

PILOT CELL AND VEHICLE METER READINGS

PILOT CELL IS CELL NO. _____

INDIVIDUAL CELL READINGS To be recorded every three months for each battery:

Battery No. _____

Date _____

Specific Gravity readings:

Temp. taken _____

Voltage readings taken:

Charging vehicle taking readings _____

Current voltage _____

Amps. _____

REGULAR CHARGE READINGS – INCLUDING BOOSTS BUT NOT INCLUDING EQUALIZING CHARGES

Date	Vehicle No.	Battery No.	Start of Charge: Time Started	Time Setting Hours	Amp. Hour Meter Reading	Charge Rate Amperes	Pilot Cell: Sp. Gr.	Pilot Cell: Temp.	End of Charge: Amp. Hour Meter Reading	Charge Rate Amperes	Pilot Cell: Sp. Gr.	Pilot Cell: Temp.	Time Stopped

GOULD STORAGE BATTERIES

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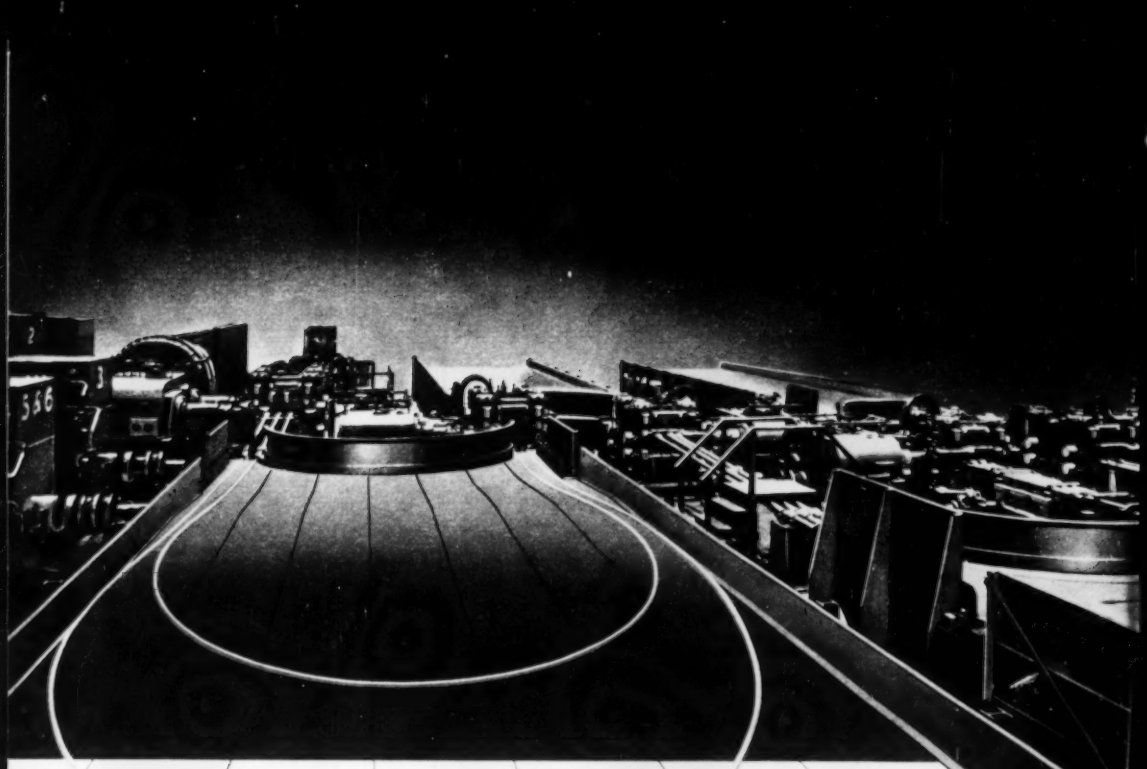
Always Use Gould-National Automobile and Truck Batteries



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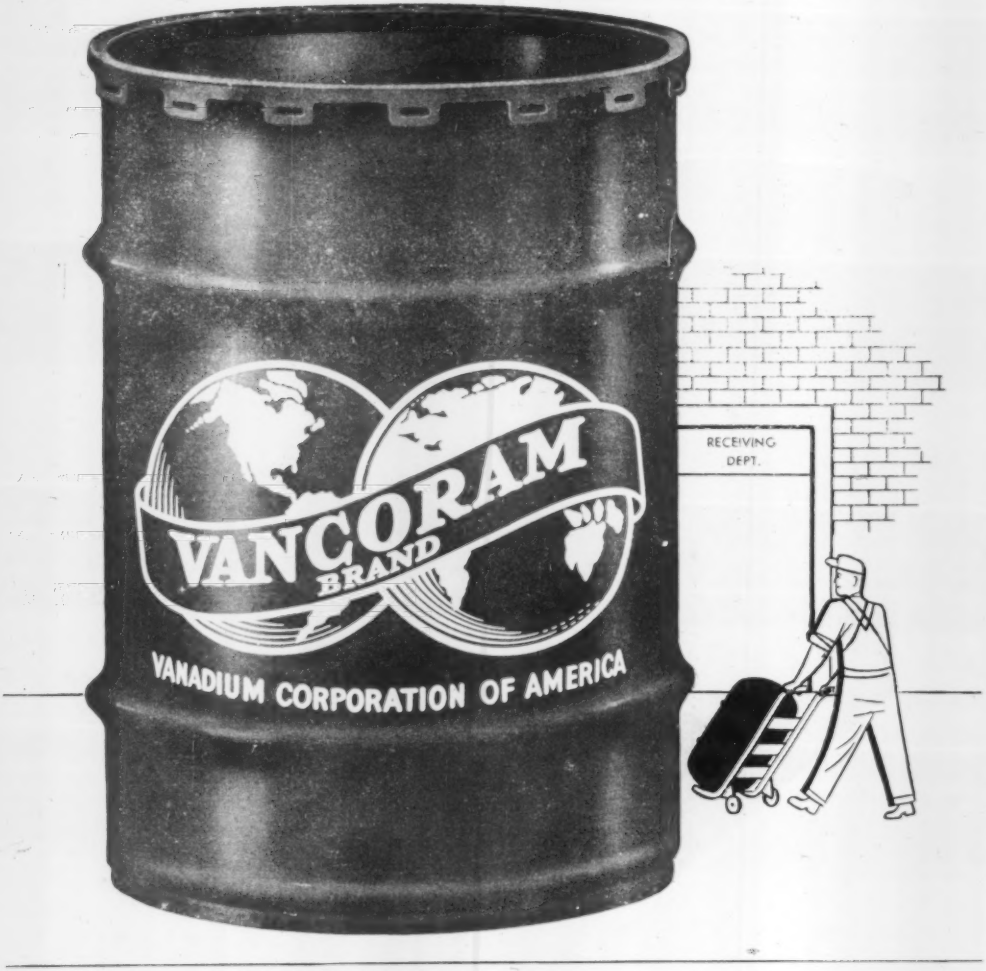

The world is at your doorstep

When you see the VANCORAM trademark you can be assured of the highest quality products it is possible to produce.

The world is truly at your doorstep, for the finest raw materials from the world over contribute to the uniformity, superior quality and maximum efficiency of VANCORAM products.

To make it easier for you to identify these fine products, shipping drums are now painted a distinctive green with the VANCORAM trademark superimposed in white—your assurance of top-notch quality.

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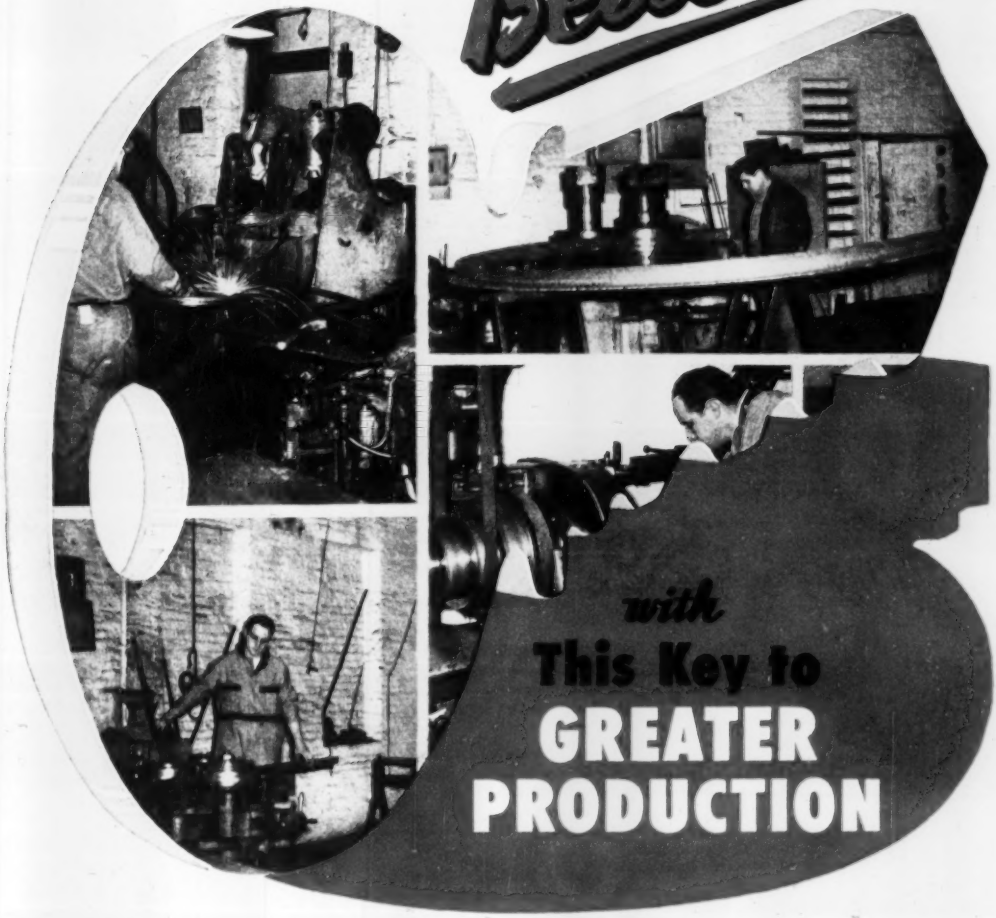
LOCK UP THE *Better* JOBS



Stands to reason you can't handle many *more* jobs but you can take on better *quality* jobs . . . jobs which return a better profit . . . jobs which demonstrate your top ability.

Well, you can go after and lock up the better jobs when you select King to supply your ring requirements. King bends and welds from bar stock, bands, flanges, angles, special shapes to your specifications. Make King your ring department. Save time, money, material, labor. A phone call, a wire, a letter will start King working as your Ring Department.

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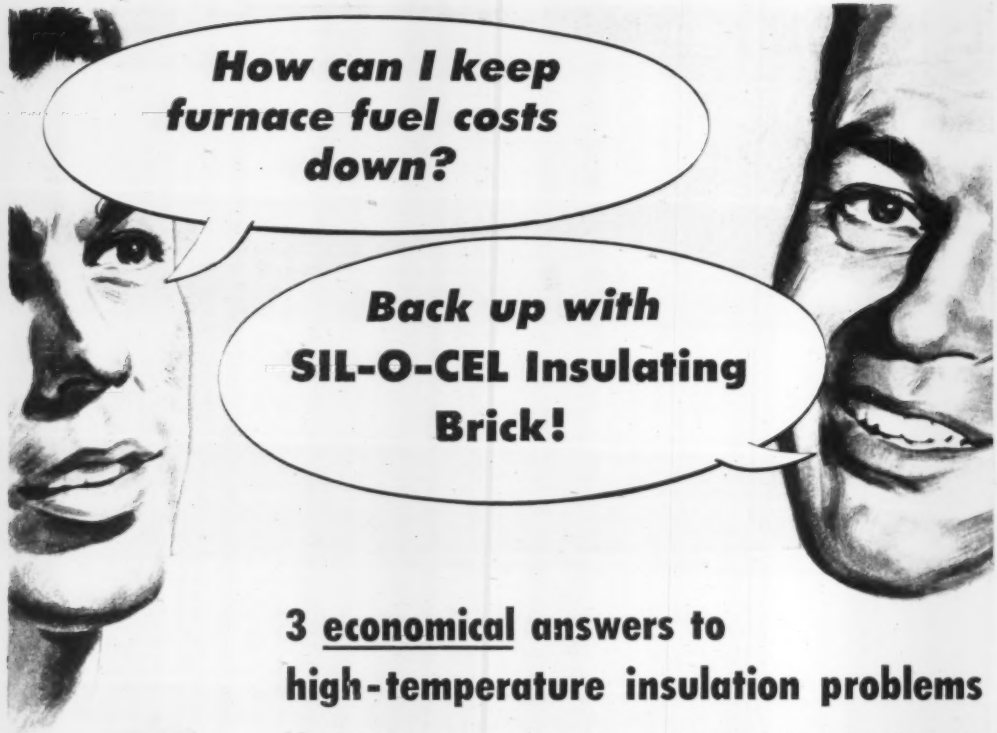
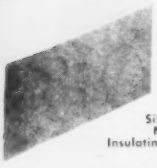
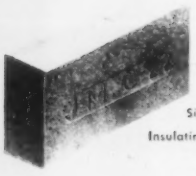


3 economical answers to high-temperature insulation problems


Sil-O-Cel Natural Insulating Brick


Sil-O-Cel C-22 Insulating Brick

Sil-O-Cel Super Insulating Brick

NATURE HERSELF has produced one of the most effective high-temperature insulating materials ever discovered—diatomaceous silica, from which Sil-O-Cel® Insulating Brick are made.

These insulating brick are used for back-up insulation behind fire brick or insulating fire brick linings in boilers, stills, stacks, heat-treating furnaces, kilns, lehrs, flues, retorts, and other types of high-temperature equipment.

Sil-O-Cel Insulating Brick have excellent insulating qualities combined with high load-bearing characteristics and light weight.

Made in all standard shapes of the 2½ in. and 3 in. series, Sil-O-Cel Insulating Brick are produced in three basic types:

SIL-O-CEL NATURAL INSULATING BRICK
for temperatures to 1600F

Quarried directly from one of the world's purest deposits of diatomaceous silica, these insulating brick have a conductivity of only 0.79 Btu in. sq ft F hr at 1000F mean temperature, with heat flow perpendicular to brick strata. Yet their density is only 30 lb cu ft. Cold crushing strength, 400 psi.

SIL-O-CEL C-22 INSULATING BRICK
for temperatures to 2000F

Ideal where high load-bearing properties are needed, this type of Sil-O-Cel is calcined, and has a cold crushing strength of 700 psi. Conductivity is 1.88 Btu in. sq ft F hr at 1000F mean temperature. Density, 38 lb cu ft.

SIL-O-CEL SUPER INSULATING BRICK
for temperatures to 2500F

A calcined insulating brick for unusually high temperatures. In many cases, it is also possible to save on construction costs by reducing the thickness of fire brick or insulating fire brick when backed with Sil-O-Cel Super Insulating Brick. Conductivity is 1.95 Btu in. sq ft F hr at 1000F mean temperature. Density, 40 lb. cu. ft. Cold crushing strength, 300 psi.

For further information, write to Johns-Manville, Box 290, New York, N. Y. In Canada, write 199 Bay St., Toronto 1, Ont.

Johns-Manville *first in* **INSULATIONS**

WHEN YOU ORDER MATERIALS FROM

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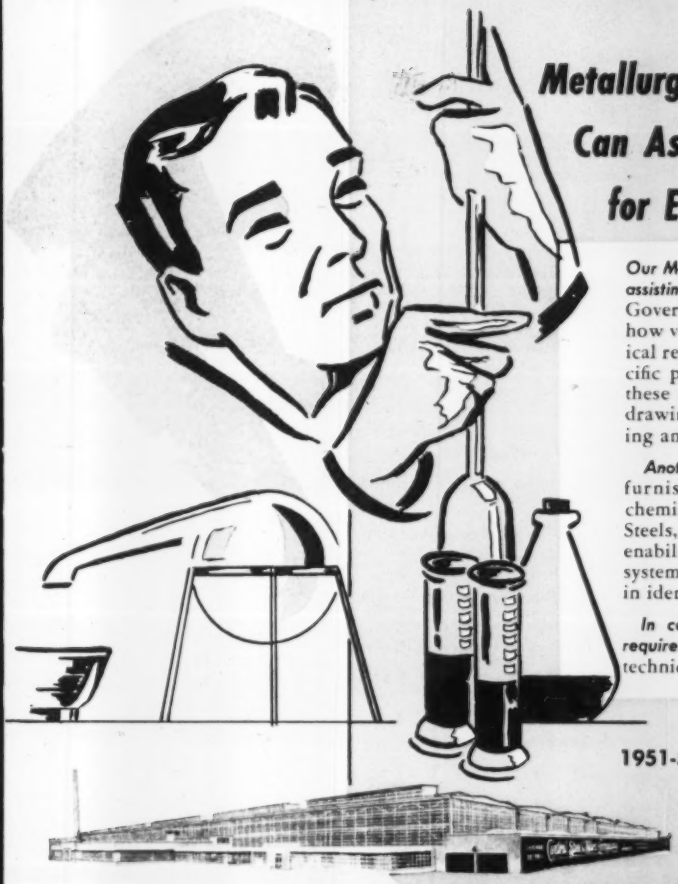

Metallurgical Engineering Assistance Can Assure the RIGHT Metal for Every Job

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In considering current and future material requirements, we invite you to share our technical experience.

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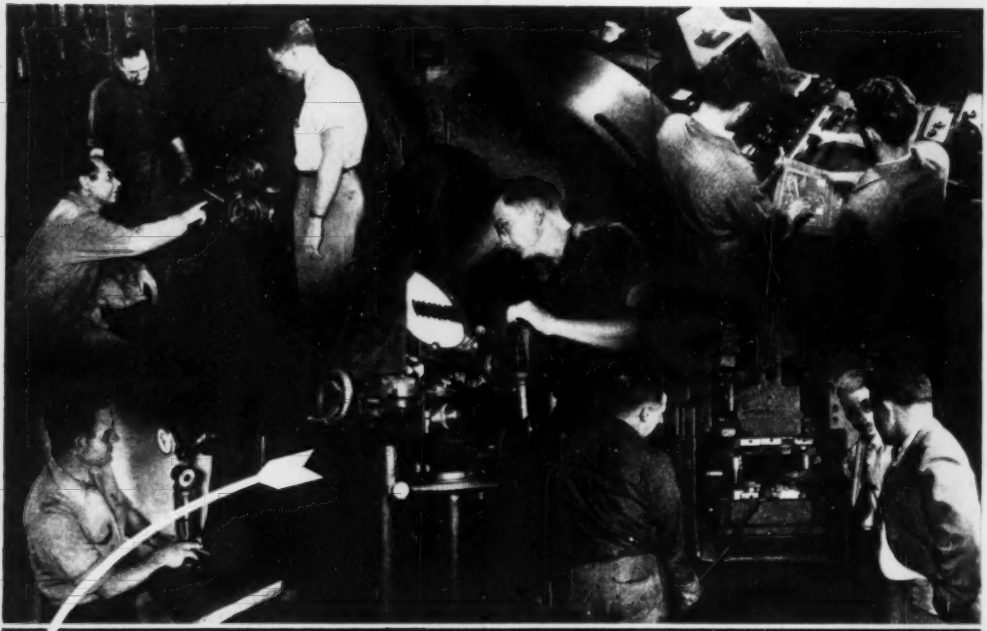

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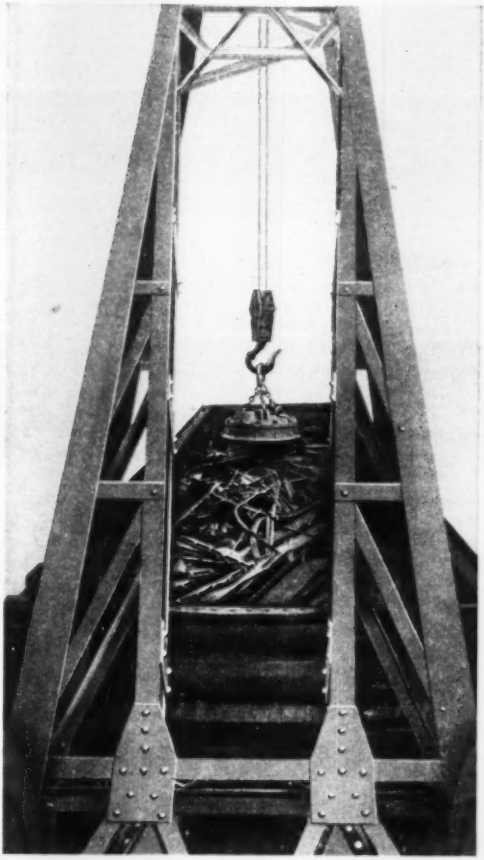
Approximate visibility with operator on side.

360 degree visibility from new Industrial Brownhoist Monitor-Type Cab.



Mounted high in the crane and surrounded by large windows, the operator in a Brownhoist patented Monitor-Type cab has full 360° visibility – forward, backward, and to both sides – providing safer operation, faster, more efficient loading and unloading. In addition the new Clear-Vision Boom is another Brownhoist feature that permits the operator an unobstructed view of his work. When unloading from high-walled railroad cars he can see right into the car.

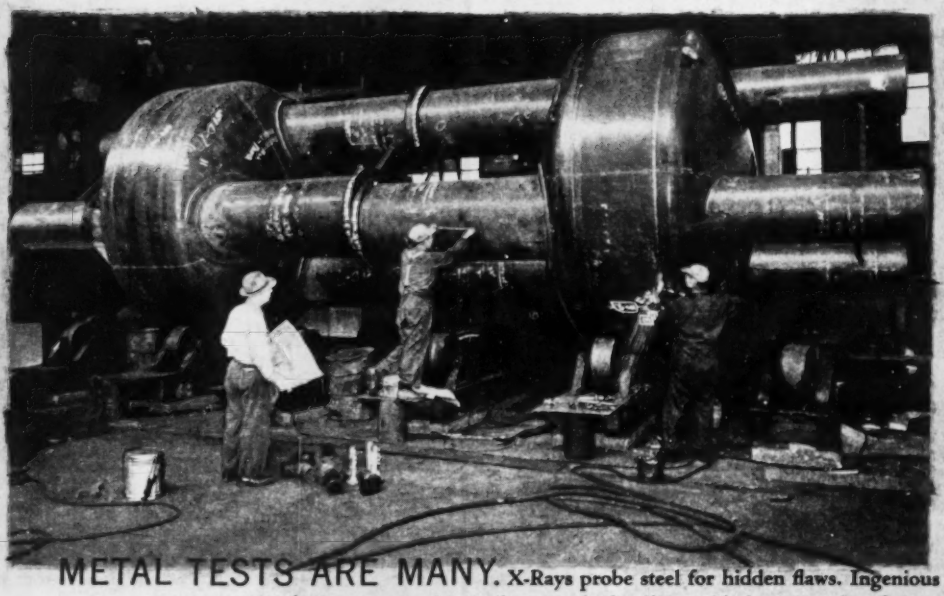
The Monitor-Type cab is also designed for the safety and comfort of the operator. All controls are conveniently located and can be easily reached from a comfortable, well-raised seat. There's a soundproof partition between the operator and the machinery. There are doors on both sides of the cab and there's a 14″ safety clearance between car body and rotating upperworks.

Brownhoist Diesel and Diesel Electric Locomotive-Cranes are available in capacities from 20 tons up for speeding materials handling with magnet, hook or bucket. Write today for complete information.

BROWNHOIST BUILDS BETTER CRANES

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago, Canadian Brownhoist Ltd., Montreal, Quebec. **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles. 148



METAL TESTS ARE MANY. X-Rays probe steel for hidden flaws. Ingenious devices measure its tensile strength, ductility, oxidation, corrosion, fatigue and other qualities. Adaptability of various alloys for electrical, thermal and mechanical needs are determined with modern engineering precision.

but 2 tests—

Length of Service...Efficiency of the Product—measure the Engineering and Craftsmanship

ON THESE TWO TESTS Sun engineering has built its remarkable reputation for special machinery and fabricated steel work, for refinery and chemical plant equipment, and for the many diverse products which its versatile equipment and trained craftsmen produce. The special units shown above will help carry on our tradition of building equipment that gives long and efficient service.

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SHIPBUILDING & DRY DOCK COMPANY

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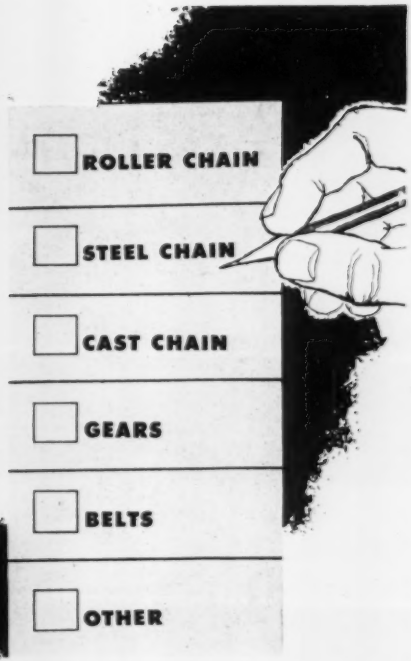
Have you made the right choice?

If you're looking for lower cost!



Let's consider the power transmission and conveying equipment in your plant. Did you know that substantial savings in first cost . . . in operating cost . . . in overall cost can be realized through proper selection and application of this equipment?

There is no one best method for all equipment. BUT there is a *right* answer to *each* application for driving, timing and conveying. In the complete Chain Belt line, you can find an answer for the vast majority of cases. Because they are not handicapped by the limitations of a limited line, Rex Field Sales Engineers can help you select the exact type of chain that is right for your machines . . . for lower costs all along the line.

The complete Chain Belt line provides a chain to exactly suit virtually every application. In those instances where belts or gears may be better, the Rex Field Sales Engineer can tell you why you should use these mediums for best results.

Your Rex Field Sales Engineer will be happy to consult with you regarding your application problems. He may be able to help you make substantial savings. Call or write your nearest Field Sales Office. Or, if you prefer, mail the coupon.

Baldwin-Rex Standard Roller Chain
Baldwin-Rex Double-Pitch Roller Chain
Rex Steel Chabelco Chain
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Chain Belt Company

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REX CHAIN & TRANSMISSION DIVISION
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Company.....*Dept*.....
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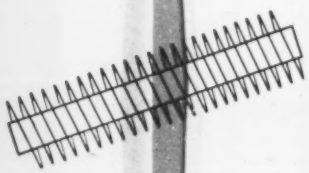
TIME IS OF THE ESSENCE

. . . in producing essential products

Here are three Wolverine developments in tubular forms which, introduced as components of your products, can contribute immeasurably in saving time and critical materials, first in installation, and then in the subsequent operation and maintenance of such products.



1

WOLVERINE TRUFIN*—used for heat transfer work, is outstanding in time-saving qualities. Since the fins are integral with the tube itself, they will withstand vibration and the tube will remain in service an exceptionally long time. This obviously reflects in fewer and less frequent tube installations. With Trufin providing an increased ratio of outside to inside surface, the performance over plain surface tube, in many cases, will be more than doubled. The saving of time, and space too, is obvious.

2

SPUN END PROCESS†—is proving a great time-saver. Its use has enabled many manufacturers—often through a simple change in the design of tubular parts (components of their products)—to completely eliminate separate end closures or other assemblies and also reduce the time and cost of assembly operations.

† *Re Issue 22465*

3

CAPILATOR*—the Wolverine capillary tube used for restriction purposes—is unique in its field. Its bore is plug drawn, assuring a perfectly smooth inside surface that allows a uniform, uninterrupted flow through the tube.

* *Reg. U. S. Pat. Off.*

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Wolverine Trufin and the Wolverine Spun End Process available in Canada through The Unifin Tube Co., London, Ontario

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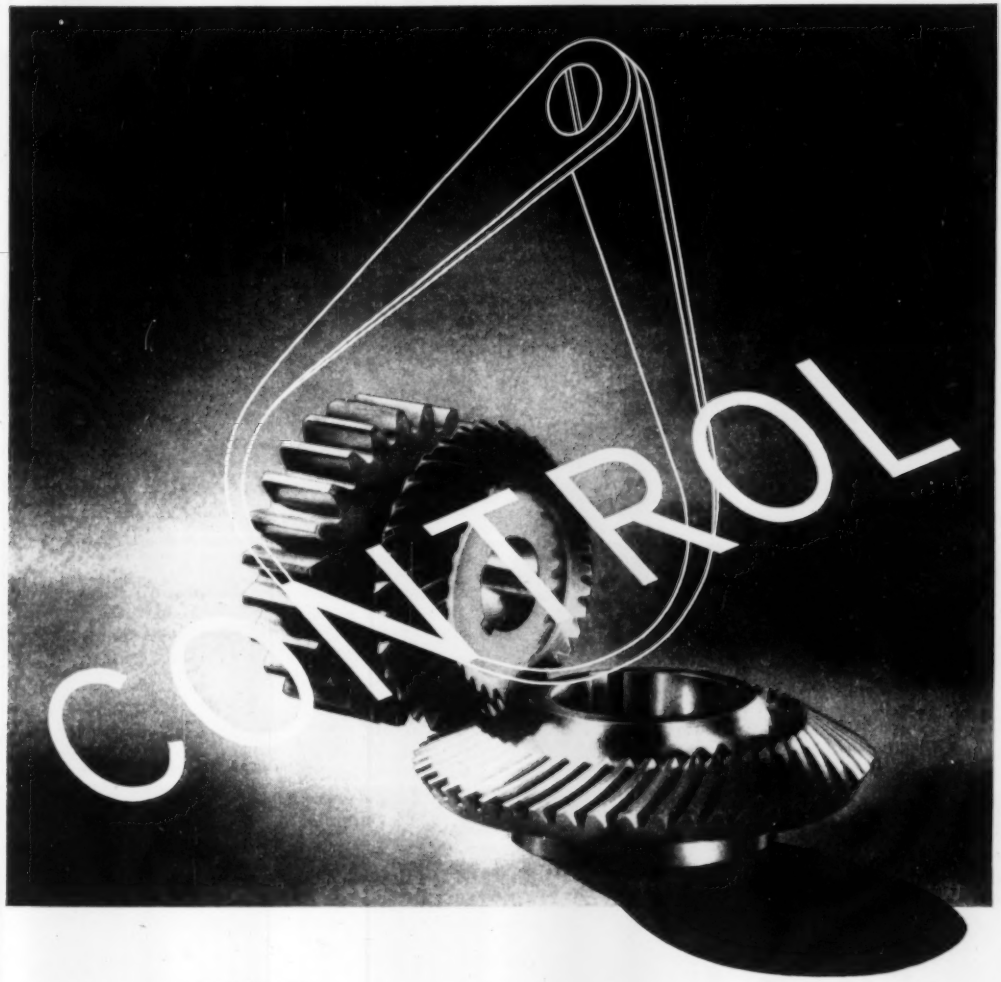


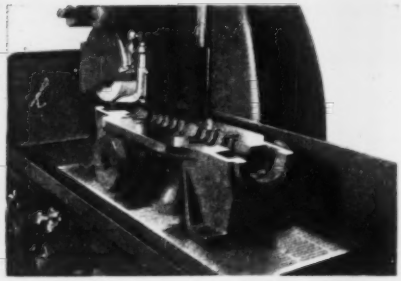
CONTROL in the manufacture of gears is, we think, a matter of complete control . . . control of every operation.

- At BRAD FOOTE we have complete control of each step from the inception of the original design to the delivery of the finished gears you use. For here . . . in our own plant . . . we design, engineer, machine, heat-treat, test, inspect, clean, and finish every gear. No one shares our responsibility.
- Our control guarantees the quality of BRAD FOOTE gears . . . gives you assurance that the gears you buy will perform satisfactorily when used in your shop . . . or on the equipment you sell to others.

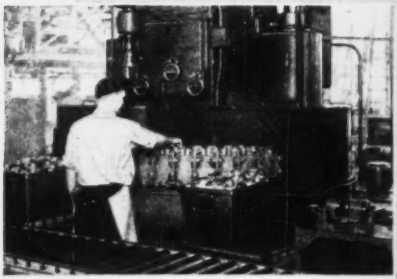
BRAD FOOTE GEAR WORKS, Inc.

BIshop 2-1070 • OLympic 2-7700 • 1309 South Cicero Avenue
Cicero 50, Illinois

WHERE THERE IS A FLAT SURFACE TO GRIND THERE'S A MATTISON TO GRIND IT.



40 hours before — now 4 hours. Pump case ground on Mattison Horizontal Spindle Precision Surface Grinder.



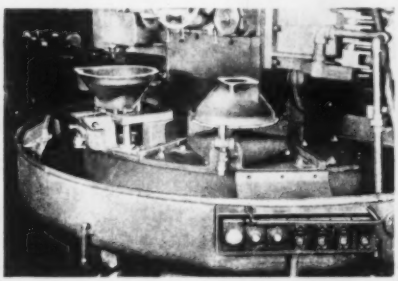
700 connecting rods per hour, using 40 station fixture to finish grind crank and wrist pin end of assembled rod with Mattison No. 72 Grinder.

With the addition of the production grinding machinery formerly made by the Hanchett Manufacturing Company, Mattison is now in a position to work with you on all your surface, face and disc grinding problems. These machines are made in various types to handle a wide range of work. Experienced engineers are available to give you best production efficiency, finish and tolerances, with Mattison machines.

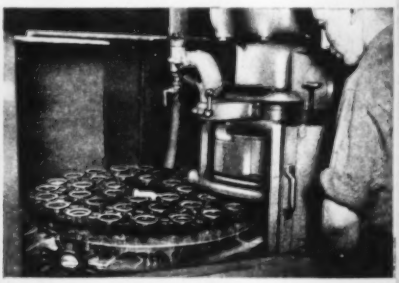
For any flat grinding ask for our recommendations on the proper method and machine for your job. No obligation, of course.

For catalogs on any of the types shown or if you would like a copy of the general bulletin, let us know and we'll gladly send them to you.

Grinding Cast-Iron Cams — 5" diameter, 1⅛" thick — stock removal, each side .030". Production 120 surfaces per hour on Mattison (Hanchett Type) Rotary Surface Grinder.



200 Transmission Case surfaces ground per hour on Mattison (Hanchett Type) Rotary Automatic Grinder. A special 8-station mechanical fixture permits one operator to grind each end of this large 35 lb. casting, flat and parallel. Stock removal .050".



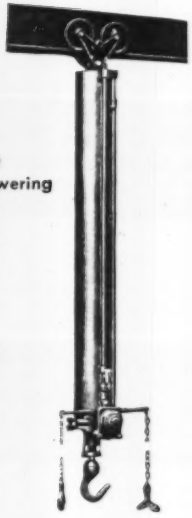
320 surfaces of cast iron compression heads per hour, removing 1/32" stock with Mattison No. 24 Rotary Surface Grinder.

MATTISON MACHINE WORKS

ROCKFORD • ILLINOIS

IT'S IMPORTANT

To SAVE MAN HOURS
REDUCE PRODUCTION COSTS
INCREASE EFFICIENCY
That's Why It Will Pay You to Investigate



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Air Hoists
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AIR COMPRESSORS
AIR-OPERATED
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Tank Mounted
Up to 15 H.P.
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Up to 50 H.P. Fully Enclosed

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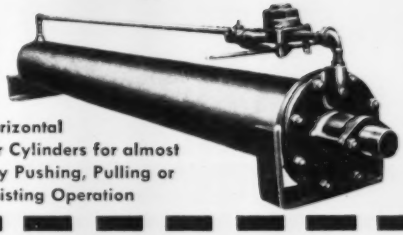

Horizontal
Air Cylinders for almost
any Pushing, Pulling or
Hoisting Operation

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Curtis equipment has stood the test of time, because it is precision made from top quality raw materials with 97 years of "know how."

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☐ **AIR HOISTS**
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☐ **AIR CYLINDERS**
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☐ **AIR COMPRESSORS**
Capacity? ☐ Pressure? ☐
Current? ☐

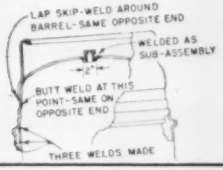
Name.....
Firm.....
Street.....
City.....Zone.....State.....

Ideas on Welded Design — For the Engineer's Notebook

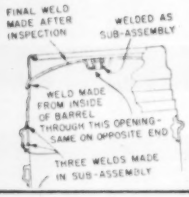
MAKE WELDS DO DOUBLE DUTY

Relocation of a single weld can sometimes turn an impractical job into profitable production. For example, this slight design change simplified jigging and saved excessive fixture and equipment costs. An enlarged tap hole subassembly makes it possible to join chime ring, head, and center section with one mechanized HELIARC weld, made from inside the barrel. One complete welding operation is eliminated at each end of the barrel.

ORIGINAL DESIGN


LAP SKIP-WELD AROUND BARREL-SAME OPPOSITE END
WELDED AS SUB-ASSEMBLY
2"
BUTT WELD AT THIS POINT-SAME ON OPPOSITE END
THREE WELDS MADE

MODIFIED FOR PRODUCTION


FINAL WELD MADE AFTER INSPECTION
WELDED AS SUB-ASSEMBLY
WELD MADE FROM INSIDE OF BARREL THROUGH THIS OPENING-SAME ON OPPOSITE END
THREE WELDS MADE IN SUB-ASSEMBLY

Better Barrels at Lower Cost...

MINOR DESIGN CHANGE CUTS WELDING TIME . . . IMPROVES PRODUCT . . . SAVES THOUSANDS OF DOLLARS ON FIXTURES

To make these stainless steel barrels as first planned would have required several hundred thousand dollars' worth of special fixtures and new equipment. Redesigning as shown avoided most of this expense.

A single HELIARC weld, made from inside the barrel, now joins chime ring, head, and center section. FIXTURE requirements are vastly simplified: total amount of welding is less. And there's no cleanup problem. The smooth HELIARC welds are free from flux and spatter, with no "pockets" to harbor bacteria.

HELIARC welding is only one of many time- and money-saving LINDE methods for fabricating metals. Whatever your metalworking problem, there's a good chance that LINDE know-how, show-how, and equipment can help you do the job better, more quickly, or at lower cost. Telephone or write our nearest office today. LINDE AIR PRODUCTS COMPANY, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in Other Principal Cities. In Canada: Dominion Oxygen Company, Limited, Toronto.

Linde Trade-Mark **Products and Processes for MAKING, CUTTING, JOINING, TREATING, AND FORMING METALS**

The terms "Heliarc" and "Linde" are registered trade-marks of Union Carbide and Carbon Corporation.

IF YOU HAVE FLUID LINES TO CONNECT

YOU'LL SAVE TIME AND TROUBLE WITH

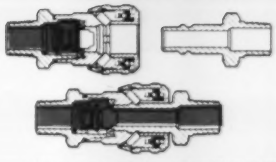
HANSEN

QUICK • CONNECTIVE COUPLINGS

HANSEN PUSH-TITE COUPLING

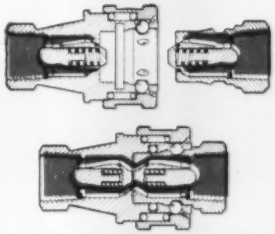
Shuts off one side of line

Gives quick connection and disconnection, with instant automatic flow or shut-off. To connect coupling, and open line to flow of fluid, merely push plug into socket. To disconnect, a slight pull on sleeve releases plug and shuts off supply end of line.



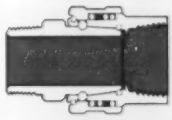
HANSEN HIGH PRESSURE TWO-WAY SHUT-OFF COUPLING

To connect, pull back sleeve and push plug into socket. Identical torpedo type valves permit free flow of gas or liquid through coupling. To disconnect, pull back sleeve..coupling immediately disconnects, valves automatically seal both ends of line. Can be mounted to disconnect automatically where fluid lines may be subject to sudden, damaging strain.



HANSEN STRAIGHT-THROUGH COUPLING

Provides quick connection and disconnection, but does not have shut-off feature. Size range for general use from ¼" to 2½". Two special types of straight-through steam couplings also available—one for low pressures, and one for high pressures.



QUICK-CONNECTIVE FLUID LINE COUPLINGS

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Export Department: CLEVELAND

Write for catalog giving complete range of types and sizes of Hansen Quick-Connective Couplings

THE HANSEN MANUFACTURING COMPANY

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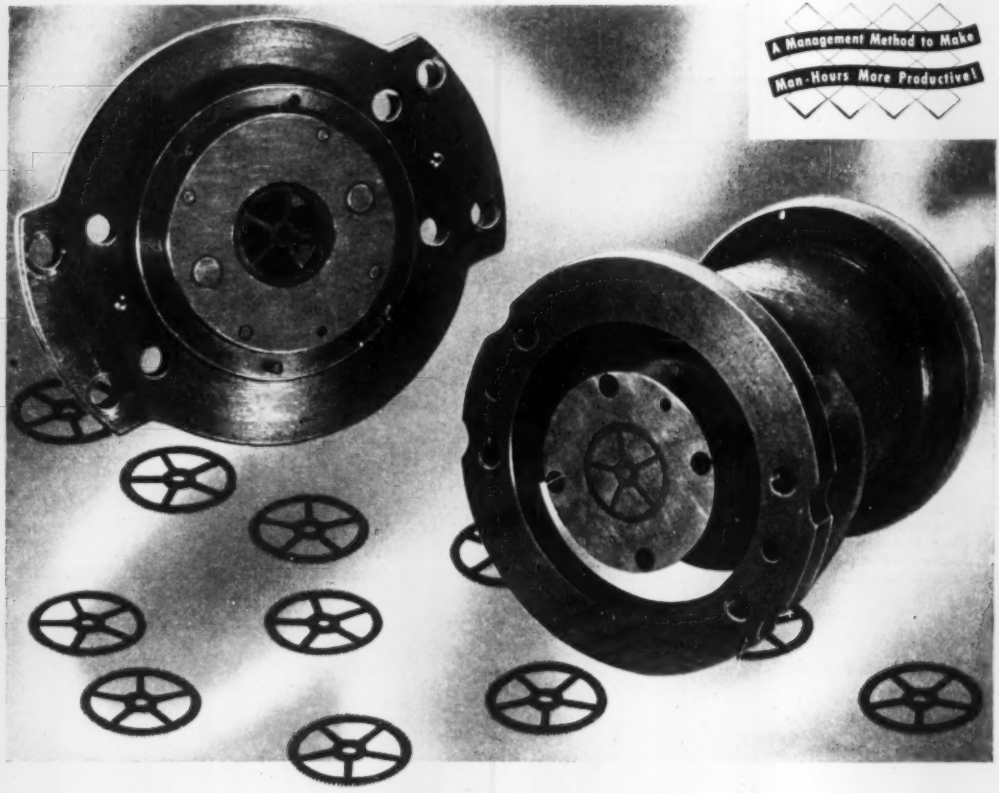


Why Not Gear Up For Today's Production *This* Way?

For 11 years this Stentor blanking die and punch gave trouble-free performance, averaging 100,000 gears per grind. This record enabled management and production to avoid production delays by keeping machines operating with fewer shut-downs for resharpening. The precision gears, 120 teeth 90 pitch, are made from 24 ga., ½-hard brass. In heat treatment the die moved only .0005" on the maximum diameter of the gear.

It wasn't a happy coincidence that the tool and die steel was perfectly suited to put production from the tools on a smooth, trouble-free basis. It was planned that way—with the help of the Carpenter Matched Set Method. For the Method not only enabled this plant to eliminate costly experimentation in selecting the right steel, but enabled management to forecast output in advance because they could count on the tools to produce the parts *on time*.

Used in hundreds of plants, the Method offers far more than simplified tool steel selection. It makes machine operators more productive. It enables your plant to carry lower tool steel inventories. It makes heat treating easier, simplifies tool-room and production procedures. What's more, it is amazingly easy to apply. No extra cost or bother. To discover what it can do for you, ask for the new booklet "How to Get Better Tool and Die Performance". THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

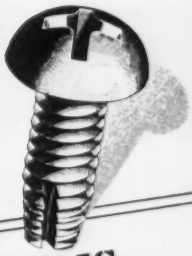
Export Department: The Carpenter Steel Company, Reading, Pa. "CARSTEELCO".

Carpenter

MATCHED TOOL & DIE STEELS

More than top-grade steels . . . a Method to keep tooling and production on schedule!

For your convenience, Carpenter carries warehouse stocks in principal cities throughout the country.



THIS IS AMERICAN

. . . your PHILLIPS HEADquarters for THREAD-CUTTING SCREWS

This Type 1 Thread-Cutting Screw is one of American's complete line of Phillips and Slotted Fastenings . . . designed to tap its own thread in metal *as it's driven* . . . so saving extra tools and an extra operation.

Made by American craftsmen, under American standards of quality control, in one of the industry's most modern high-production plants, American Screws and Bolts are one of the stoutest assurances of quality control *for your own product.*

AMERICAN SCREW COMPANY

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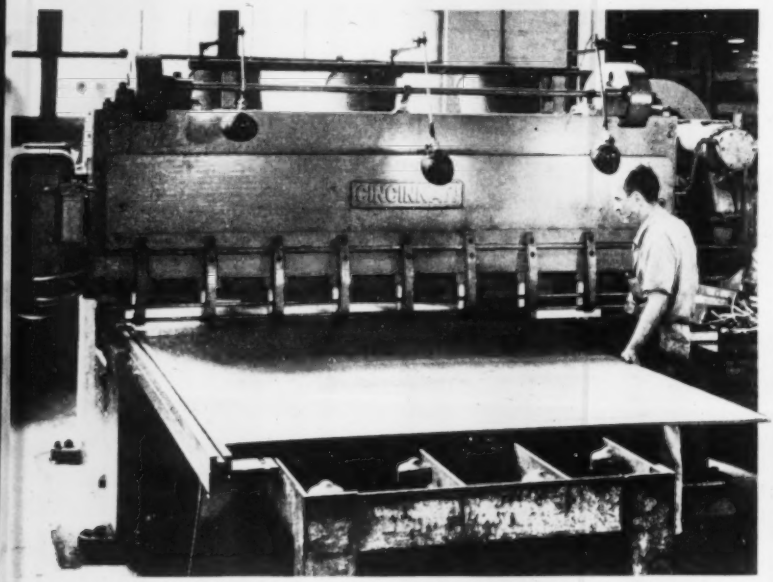
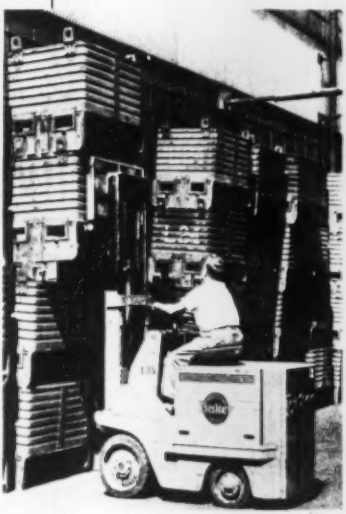
• BAKER-RAULANG COMPANY, says:

a Cincinnati Shear brought these results



1	lower costs
2	stable deliveries
3	steady stock supply
4	flexible manufacturing



Photos courtesy Baker Raulang Company, Cleveland, Ohio

With the installation of this Cincinnati Shear, a do-it-yourself program replaced dependence on outside sources at the Baker-Raulang Company, manufacturers of industrial trucks.

Sheets of any required size are now sheared without delay and are always ready for assembly when needed. This results in a smoother, controlled manufacturing schedule, reduced inventory and, at the same time, improved deliveries.

The accurate performance of Cincinnati Shears reduces shearing costs —savings in subsequent fabricating operations result from better fits.

If you use sheared sheets, a Cincinnati Shear in your own shop may save you money.

Write for Catalog S-5—covering the very complete line of Cincinnati All-Steel Shears.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

STEEL

The Metalworking Outlook

September 3, 1951

Freight Car Shortage Threatens

Prepare for a freight car shortage. It will be temporary but severe as railroads divert more equipment to grain hauling in the West. The first signs are being felt in Chicago where some steel plants are having troubles getting out of the mills tonnages that are ready to ship. Trucks can be used to relieve some of the congestion, but there's a shortage in trucking, too.

More Defense Money

Defense spending is mounting. In July, the Defense Department obligated $4.9 billion for major equipment, supplies, military construction and expansion of production facilities. That's far above the average monthly expenditures—less than $3 billion—allotted for those purposes since the Korean War began. In the 13 months following the attack on Korea, Defense had obligated a total of $40.2 billion for procurement and construction, of which $33.9 billion represents "hard goods" procurement, $4.4 billion "soft goods" and $1.9 billion construction.

Accent on Brass

More brass is needed for ammunition production, and supplies for civilian purposes and even some defense uses are bound to get tighter. An Ammunition Scheduling Committee is now being formed to include representatives of the Munitions Board, the Armed Services and the Copper Division of NPA. To schedule production of ammunition brass at the mill level, the committee will meet monthly, starting in October.

Foreign Scrap Comes In

DPA has authorized General Services Administration to borrow $7 million from Defense Production Act funds to obtain steel scrap from foreign sources. The scrap will be resold to mills in the U.S. An estimated 300,000 tons of steel scrap is expected from Korea; 250,000 tons of iron scrap from India. GSA officials have gone to Korea to carry out negotiations. They may go on from there to the Marianas where another project, the raising of 197 sunken Jap ships, is to be investigated.

Coming: Revision in CPR 22

Watch for a revised CPR 22, the general manufacturers' price order. Changes are required to conform with revisions in the Defense Production Act of 1950. Manufacturers will probably have the option of retaining prices already calculated under CPR 22 or of recalculating ceilings and coming under the revised order. The revised CPR 22 may give a different base period, a later cut-off date for

Production Engineering News—p. 87 The Market Outlook—p. 151

figuring costs changes and provisions for reflecting overhead cost changes. As it now stands, CPR 22 excludes increases in overhead expenses.

Pressure for Speed

The pressure is mounting on OPS for more speed in getting out the various price orders. The across-the-board complaint from industry is that many new regulations come out so slowly that some of the good features in them may not be duly appreciated because of the long wait to get them. Prospects for greater speed from the agency are fair.

Pension Scheme for Defense

"Voluntary group annuities" operated by the government may be adopted by the U.S. as a method of solving the problem of worker mobility in the defense period. The proposal would aim to facilitate transfer of workers from nondefense industries while protecting the pension rights accrued in the service of a nondefense employer. The plan would make annuities equal to the actuarial value of contributions made by or for the employee available for voluntary purchase. The annuities would be payable at 65 concurrently with old age payments. If the plan is adopted, a statutory freeze of pension credits and guarantee of re-employment rights would also have to be effected.

Needed: More Labor in Hartford

The six major defense production areas that have the worst labor shortages are Hartford, Conn.; Wichita, Kans.; Indianapolis; San Diego, Calif.; Davenport-Rock Island-Moline area and Aiken, S.C.-Augusta, Ga., area. The government may have to come through with some incentives to get more workers to migrate to those regions.

Straws in the Wind

Reconstruction Finance Corp. has switched its lending policy to enable it to make real estate loans for defense purposes . . . The Senate Finance Committee has voted to tax co-operatives more nearly the way corporations are taxed . . . The group is still working away on the corporations tax bill; it may be more lenient than the House version, but corporate levies will still be rough.

Here and There in Industry

WSB's permission for companies to grant cost-of-living wage increases may bring a stampede to have an escalator clause in more labor-management contracts (p. 59) . . . Fourth quarter CMP steel was not over-alloted, NPA says; duplicate orders cause the grief (p. 60) . . . Spring makers want more stretch in price curbs (p. 61) . . . Porcelain enamelers are looking for new uses to take up the current slack in their production (p. 62) . . . Demand for welding positioners soars as the need for more welding increases (p. 63) . . . DPA has approved a $46 million loan to Harvey Machine Co. to construct an aluminum plant at Kalispell, Mont. (p. 63) . . . Advance planning will yield a rich return on the time and money you invest in attending conventions (p. 69).

Only MARVEL *builds all four**

While it is true there are several builders of hack sawing machines and many builders of band sawing machines, only MARVEL builds *BOTH* hack saws and band saws. The fact is that MARVEL manufactures 35 models of 10 basic types of metal sawing machines which include the world's fastest automatic production saw, the world's largest giant hydraulic hack saws, the world's most versatile band saw and the most widely used small shop saws.

With intimate and broad field experience in all types of metal cutting-off equipment and 35 different saws available, it is obvious that MARVEL Field Engineers occupy a unique and exclusive position in the industry. They are eminently qualified to make expert and *unbiased* recommendations covering the type, size and model of metal sawing equipment best suited to individual requirements—the most efficient, most accurate, fastest, broadest in scope and the most economical.

MARVEL is also the only manufacturer of both metal sawing *machines* and metal sawing *blades*. Because the efficiencies of both the machine and the blades are interdependent, each upon the capability of the other, expert knowledge covering both saws and saw blades is essential to the proper appraisal of any specific sawing situation. Correct balance of cutting speed and blade life, feed pressure and blade tension are all potent factors in over-all performance. Here again it is the MARVEL Field Engineer who is qualified to provide the comprehensive answer to your question. His job is to help you saw metal most efficiently—his services are available upon request—gratis.

***HACK SAWING MACHINES**

***BAND SAWING MACHINES**

***BAND SAW BLADES**

***HACK SAW BLADES**

4

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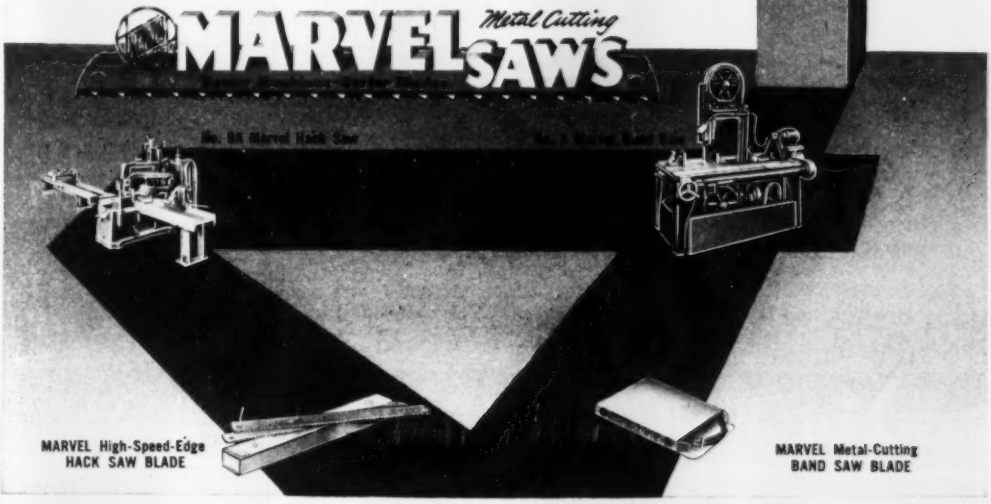

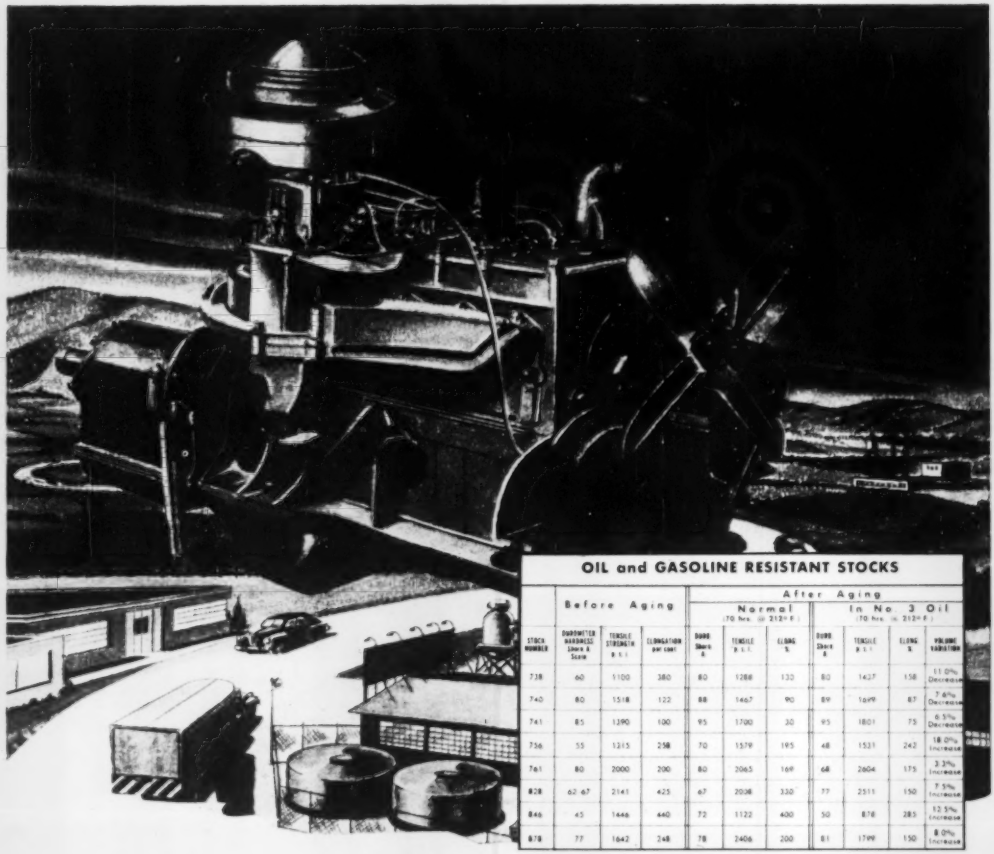

OIL and GASOLINE RESISTANT STOCKS

	Before Aging			After Aging						
				Normal (70 hrs. @ 212°F.)			In No. 3 Oil (70 hrs. @ 212°F.)			
STOCK NUMBER	DUROMETER HARDNESS Shore A Scale	TENSILE STRENGTH p.s.i.	ELONGATION per cent	DURO Shore A	TENSILE p.s.i.	ELONG %	DURO Shore A	TENSILE p.s.i.	ELONG %	VOLUME VARIATION
738	60	1100	380	80	1288	130	80	1427	158	11.0% Decrease
740	80	1518	122	88	1467	90	89	1699	87	7.6% Decrease
741	85	1290	100	95	1700	30	95	1801	75	6.5% Decrease
736	55	1215	258	70	1579	195	68	1531	242	18.0% Increase
761	80	2000	200	80	2065	169	68	2604	175	3.3% Increase
828	62-67	2141	425	67	2008	330	77	2511	150	7.5% Increase
846	45	1446	440	72	1122	400	50	878	285	12.5% Increase
878	77	1642	248	78	2406	200	81	1799	150	8.0% Increase

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Engineered to withstand petroleum products and their derivatives, rubber parts produced by STALWART are daily specified for applications in aircraft, automobiles, trucks, ships and railroad rolling stock.

STALWART can fabricate oil and gasoline resistant rubber parts having tensile strengths up to 2600 pounds p.s.i., durometer hardness from 45 to 95, and elongation ranging from 122 to 400 percent. In addition, these same stocks can be compounded to afford excellent resistance to weathering, abrasion, and temperatures (low and high).

STALWART can furnish precision-made rubber parts in production quantities to meet individual, S.A.E. and A.S.T.M. specifications as well as the SB specifications under MIL-R-3065 (superseding ARMY 20-116A)

The urgency of maintaining continuous operation of both transportation and industrial facilities is becoming increasingly important, and STALWART is keeping pace with demands made upon rubber parts by developing better and longer lasting compounds.

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Do Your Part!

Department of Commerce reports that in 1950, Americans averaged an income of $1436 for each man, woman and child in the nation. This was a gain of $116 or 9 per cent over 1949 figures. The report stated that this 9 per cent rise in average income outstripped the 6.5 per cent advance in the cost of living in 1950 reported by the Bureau of Labor Statistics.

The report also stated that the burden of federal, state and local taxes averaged $360 for every man, woman and child during the 12 months ended June 30, 1950. This is about 25 per cent of the average income of $1436. Thus in 1950, Americans were working more than three months of the year for their federal, state and local governments. Income will be higher in 1951, but taxes will be even higher. Department of Commerce figures for 1951, when released in 1952, may show that each citizen paid out 30 per cent or more of income in taxes.

Competent authorities have stated that no nation can survive long if it imposes taxes exceeding 25 per cent of income for more than short, emergency periods. Mr. Truman and his lavish spending associates hold out no hope that high taxes are a short-term necessity. They tell us we must pay through the nose for a decade or more.

But that is not all. If Mr. Truman had been permitted to have his way, we now would be burdened by Ewing socialized medicine, Brannan socialized farming, Truman socialized education, a TVA in every river valley and dozens of other to-hell-with-the-cost projects. If the nation had followed Mr. Truman's advice implicitly, we now would be so heavily burdened by the cost of socialistic programs that in order to meet the minimum cost of national defense we would have to ask every man, woman or child to cough up $718 or half of his or her $1436 income for taxes.

The relatively few persons in Congress who are fighting this outrageous folly of reckless spending need more and better support. Why not write to them today!

E. L. Shaner

EDITOR-IN-CHIEF

FREE TRADE IN IDEAS: Shortly after Labor Day the American convention season gets into full swing. It continues at a brisk pace through September, October and November, slows down a bit in December and January, regains its momentum in February and goes full tilt until June, when it tapers off for the summer. During this active season about 10 million

people attend 20,000 conventions. About 2500 of these are important to business and of these 2500 approximately 500 deal with problems of the metalworking industries.

Metalworking establishments will send about 250,000 persons to conventions and exhibitions during the approaching season. They will devote at least 750,000 man-days to these affairs and will spend in excess of $37.5 million on them. This investment of substantial amounts of time and money will pay handsome dividends if the convention visitors will take ordinary pains to capitalize on the benefits which most conventions provide. In the United States, more than in any other country, contemporaries exchange "know how" and experience liberally at conventions. —p. 69

IN SPITE OF INFLATION: In today's hectic world we are prone to assume that inflation has caused the prices of almost everything to be double or triple what they were in the "good old days." We assume this without taking into account the important factor of technological progress.

The six-cylinder engine in the 1912 model of the Olds Limited was 5 feet long, had a displacement of 707 cubic inches and developed 60 hp. The car it powered was listed at $4600 at Lansing, Mich. Today's Olds V-8 Rocket is powered by an engine less than 3 feet in length, having a displacement of 303 cubic inches and developing 135 hp. This car is listed at $2042, Lansing. Improvements in design, materials and manufacturing processes have provided a smaller, better engine, generating 2¼ times as much power, in a car that sells for 44 per cent of the 1912 price—in spite of inflation! —p. 74

ODD BASE FOR WAGES: Last month Wage Stabilization Board revised Regulation 8 to permit present cost-of-living contracts to remain in force regardless of when they were negotiated, to allow new escalator contracts to be written and to permit granting of cost-of-living wage increases even to employees who are not covered by an escalator contract.

That the revised regulation is effective until Mar. 1, 1952, gives it the appearance of being a stop-gap or temporary measure. In reality the escalator arrangement is not based on sound economic principles. Many union leaders accept it now simply because it works in their favor. Should the cost of living remain stable or decline most unions would drop the idea as they would a hot potato.

We have strayed far from the sound idea that wages are related to the amount of work performed. —p. 59

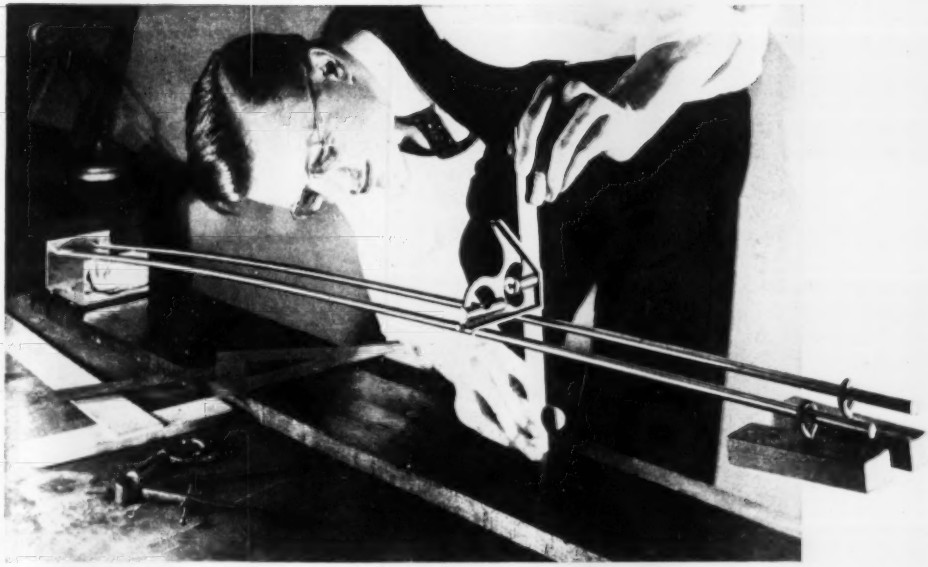
DOUBLES THEIR LIFE: Sometimes careful attention to little things results in important savings. Tote boxes are used in many metalworking plants, but it is doubtful whether more than a relatively few companies take the trouble to see that their tote boxes are repaired or reconditioned periodically.

Caterpillar Tractor Co., Peoria, Ill., is inaugurating a program whereby every one of its approximately 187,000 tote boxes will be given a thorough reconditioning about every two-and-a-half years. Each box will go into an airless blast cabinet for removal of rust and chipped paint. After rinsing and drying, it will be repainted. It is expected that adherence to this simple plan of periodic reconditioning will practically double the normal life of the boxes.

In plants where the number of tote boxes runs into the tens of thousands, doubling their life represents a substantial economy. —p. 98

INGENUITY PAYS OFF: Aircraft exhaust systems and jet engine components require numerous parts made of heavy gage corrosion-resistant steels in shapes involving compound curves and sharp radii. Ryan Aeronautical Co., San Diego, Calif., has been adapting drop hammer technique to this type of work during the last decade or more. Today the drop hammer department is turning out seven parts per man-hour compared with 3.8 at the peak of World War II.

Most of this marked gain in output is attributed to ingenious developments in drop hammer practice. These include improved dies, a clever method of locating parts in dies—called "pre-positioning," use of a water-soluble lubricant and time-saving changes in the sequence of forming operations. Many of these new practices originated in the form of employee suggestions. Also, their success depends in large measure upon the skill of the hammer operators. —p. 88



Which Steel Bends the Most?

✓ Low Carbon—Mild Steel or
✓ High Strength—Heat Treated Alloy Steel

One of the bars being tested above is a standard low carbon steel. Good steel, yes, but not noted for hardness or extra strength. The other is a high strength, heat treated alloy steel metallurgically designed to outperform the first steel in most every way. Yet, as shown in the picture, when both bars are of the same size and length and carry the same load, both bend the same amount.

Why is this so? In spite of what common sense indicates, the ability of a steel to resist deflection (bending) is not dependent upon the composition or mechanical properties of the steel—but on the design or size of the structure. The technical man puts it this way, "All steels of the same size and shape, when subjected to the same stress will deflect practically the same amount regardless of composition or physical properties, provided the imposed stress does not exceed their elastic limits."

Just what does this mean to you? Simply that if too much deflection occurs, the only remedy is to use a larger size or a different shape. Changing to a higher strength steel allows greater deflection without permanent distortion (the elastic limit is higher), but the bending itself will not be lessened.

This interesting and odd steel fact is probably well known to you. However, the fast changing analyses and requirements of the defense program have brought new situations—new problems on which you may need counsel. Whenever you feel the need to discuss a steel question with others, we sincerely invite you to talk with experienced Ryerson steel men. They will work closely with you, and their experience may be particularly helpful to you at this time.

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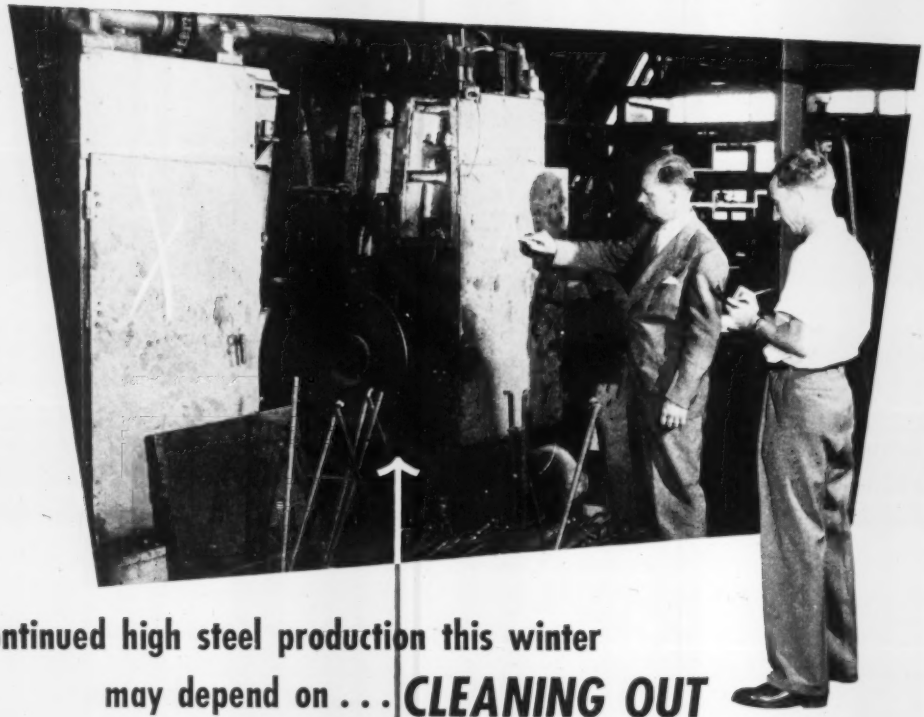

Continued high steel production this winter may depend on . . . CLEANING OUT YOUR SCRAP THIS MONTH

HOW TO TURN SCRAP INTO MONEY with an organized dormant scrap round-up in your plant:

1. Appoint a top executive with authority to make decisions to head the salvage drive.
2. Organize a Salvage Committee and include a member from every department.
3. Survey and resurvey your plant for untapped sources of dormant scrap. Encourage your employees to look for miscellaneous scrap and report it to the committee.
4. Sell your entire organization on the need to scrap unusable material and equipment.
5. Prepare a complete inventory of idle material and equipment. Tag everything not in use.
6. Start it back to the steel mills by selling it to your regular scrap dealer.
7. **KEEP AT IT!**

***DORMANT SCRAP** is any obsolete, broken or worn-out and irreparable machinery, tools, equipment, dies, jigs or fixtures, etc., that may encumber your premises.

Despite . . . and because of . . . the continued high rate of steel production, the steel industry is on a hand-to-mouth basis in its receipts of purchased scrap . . . *essential to production!* Mills that normally inventory a 60 day supply of scrap, are now maintaining high production with less than a week's supply on hand. *That the effect of winter on transport facilities could quickly exhaust these dangerously meager scrap inventories . . . and thus force a cut in steel production . . . is obvious.* Help assure an uninterrupted steel supply by rounding up and selling your dormant scrap* to your regular scrap dealer *this month!*

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Labor Has Its Day—In Advance

WSB's revised Regulation 8, issued late last month, gives carte blanche to most cost-of-living boosts and may start a stampede toward escalator contracts

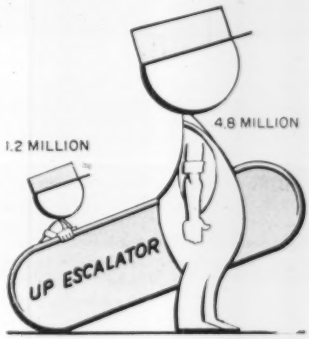
LABOR had its day a little in advance of the holiday on Sept. 3. The real Labor Day came late last month when the Wage Stabilization Board issued its revised Regulation 8, a ruling that promises to have a profound effect on all labor contract negotiations from now on.

The regulation, to be in effect until Mar. 1, 1952, allows present cost-of-living escalator contracts to remain in effect regardless of when they were negotiated. Those contracts tie workers' pay to the U. S. Bureau of Labor Statistics' consumer price index, or some other acceptable index. The ruling allows new escalator contracts to be made and will allow cost-of-living boosts to be made even to those workers not covered by an escalator contract, although those hikes can come every six months only, not quarterly as provided in most escalator contracts.

More Attractive — The development gives a new importance and attraction to the escalator contract and is likely to figure in more union demands henceforth. Contrary to popular opinion, the majority of people employed by metalworking companies are not now affected by escalator clauses. The pictogram shows that only an estimated 20 per cent of metalworking's employment come under the controversial type contract.

Although the revised Regulation 8 gives virtual carte blanche to all cost-of-living pay increases, whether they come under escalators or not, unions without the clause will probably feel safer if they have the provision. For one thing, they'll get wage reviews on a quarterly basis with the clause, on a six-months basis without. For another, the government ruling gives a terrific impetus to the escalator trend and many unions will want to be on the bandwagon.

Most Unpleasant—The majority of metalworking companies will submit with reasonable calm to cost-of-living boosts as long as the practice appears to be temporary, but they do not want to commit themselves to an escalator contract—tied to a government index—that has every appearance of becoming permanent. The



METALWORKERS ON THE ESCALATOR
. . . one in five ride with contract

Mar. 1, 1952, expiration date gives hope that spot cost-of-living hikes will be temporary. But if enough unions stampede for the contract provision, the cut-off date may be made meaningless.

A total of 2.9 million employees are covered now by escalator plans. An estimated 42 per cent of those are in metalworking, 42 per cent in transport industries, 10 per cent in construction and textiles and the remaining 6 per cent scattered among various manufacturing and nonmanufacturing industries. Most employers with escalator contracts are big organizations like the auto makers.

A Matter of Size—Smaller companies believe they can't afford escalator plans. Firms—most of them small—in such key industries as machine tool and tool and die fields are likely to fight the trend to the last ditch. One of their arguments is that the escalator plan is adaptable—if at all—only to those mass production industries where the importance of the highly skilled worker is not as great. Small companies will be backed in their arguments by the industry members of WSB who signed Regulation 8 but warned that "escalator arrangements are not based on sound economic principles.

Of the 80 national and international unions that have negotiated escalator contracts, nearly all are giants.

GM Pays 1 Cent-an-Hour More

Some 394,000 hourly and salaried General Motors Corp. employees began receiving a cent-an-hour more or its equivalent Sept. 1 because the Bureau of Labor Statistics' consumer price index for July 15 went to 185.8, compared with 184.5 for Apr. 15, the date when the cost-of-living allowance last was reviewed. Those employees had been receiving a 19-cent hourly cost-of-living allowance or its equivalent in June, July and August.

GE Offers 2½ Per Cent Hike

General Electric Co. has offered its 207,000 employees a 2½ per cent general wage increase plus the additional cost-of-living wage boost.

If the offer is accepted, it will bring GE pay levels as of Sept. 15 to about 17 per cent above those which prevailed before the Korean war began.

What They Think of CMP; Steel Officials Testify

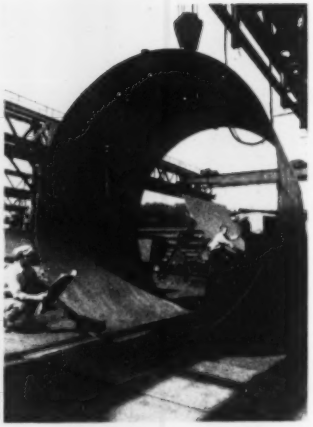
HOW DO you like CMP? The Burton subcommittee of the House Small Business Committee posed that question to steel executives in hearings on steel distribution. Their consensus: We don't like a number of things about it.

Mr. Hamilton—James L. Hamilton Jr., sales vice president of Granite City Steel Co., says it's impossible for any one person to keep up with all the corrections and revisions coming out about CMP. He thinks CMP is not necessary now; a single-band priority system covering direct military requirements should suffice. By the end of the first quarter of 1952—always barring an allout shooting war—most present difficulties will have been overcome.

Mr. Mackall—Paul Mackall, sales vice president of Bethlehem Steel Co., says government controls are unnecessary and, except for giving direct military requirements No. 1 priority, should be abandoned. He points out that direct military requirements for steel in 1951 are not in excess of 10 per cent of the present product and for 1952 not in excess of 15 per cent. He believes there isn't any one person or board smart enough to divide up for an economy as big as ours the steel that is left

over after taking care of direct military needs. The steel industry, with its distribution experience, should be allowed to try to handle the job as normally as possible. He says that in 1950 Bethlehem increased shipments to small business 23 per cent over 1947; a 28 per cent boost occurred in the first five months of 1951.

Mr. Wiese — J. Frederick Wiese, sales vice president of Lukens Steel Co., says CMP is a pretty good instrument, but he doesn't think it's absolutely necessary, merely to support a military load of about 10 per cent. One fault in the whole program, in his opinion, is that a specialist like Lukens is treated like a straight-line producer. It specializes in plates of unusual qualities and sizes, but is forced to ship plates for freight cars just like a tonnage mill. Lukens had to reject CMP tickets equivalent to 50 or 60 per cent of the company's September plate schedule. He praises the NPA action allowing a period of grace when steel producers can accept tonnage from historical customers to the exclusion of "strangers."



RINGER: Three tons of steel going into this 12-foot ring will start paying dividends next year. The ring will be the base for the first of nine open-hearth stacks being erected at U. S. Steel's new Fairless Works. The stacks are fabricated in half-circle sections at Ambridge, Pa., by American Bridge

NPA Gets Tough

CMP steel not over-allotted, it says. Problem caused by users who didn't cancel duplications

"CMP steel tickets for the fourth quarter have not been overissued. The trouble is due to consumers' failure to cancel out duplicate tonnages."

That flat statement, issued for STEEL, comes from Norman W. Foy, assistant NPA administrator in charge of the Metals & Minerals Bureau. His regular job is general manager, sales, for Republic Steel Corp. The statement also comes from DPA - NPA Administrator Manly Fleischmann.

Getting Tough—About 25 per cent of the fourth-quarter CMP steel tickets have already been sent out, and the remaining 75 per cent were being put in the mail late last week. Along with those 75 per cent of the allotments will appear this statement: "CMP Regulation 1 requires that you cancel all outstanding orders for controlled materials which duplicate or are in excess of allotments authorized on Form CMP 4-B. Any person violating this regulation is guilty of a crime and may be prosecuted."

Much of the duplication results from the failure of consumers to cancel out orders under the old DO plan. NPA has referred the matter to its compliance division, but since that units legal machinery moves slowly it issued the prosecution statement with 75 per cent of the allotments in the sternest warning it has yet given about CMP.

Forced To Do It—NPA took this latest action because of a new flood of complaints about the controls program. The agency concedes that hardships are frequent, but hopes that its warnings will ease some of the difficulties.

The roughest fourth quarter steel situation is in heavy structural shapes, NPA admits. There's simply not enough to go around, at the current monthly production rate of 400,000 to 425,000 tons. One reason for the situation is that NPA field offices issued too many approvals for orders of less than 100 tons per month without CMP tickets. The offices were allowed to do that in the belief that the action would help the little fellow, but the move has boomeranged.

Trouble Ahead—Another situation that promises trouble is the X-3 allotment for steel. NPA field offices, for allotments effective starting in the first quarter, have been empowered to issue X-3s to small consumers who use 100 tons of steel products or less per quarter. Some 3000 have already been issued in the Chicago area alone covering the first three quarters of next year. Allotments average about 20 tons each. Policy of some steelmakers is to accept them if they come from regular customers and to reject if from new.

Another trouble spot is warehousing. The warehouse order granting more steel to distributors (STEEL, Aug. 27, p. 43.) got delayed and now cannot be issued in time to be effective in the fourth quarter and must be postponed until the first.

Where To Ask CMP Questions

If you're a small businessman and have a question about your fourth-quarter CMP application or allotment don't write to Washington. Contact your Department of Commerce field office.

Here's the yardstick for determining whether the National Production Authority considers your business a small one: Yours is a small business if your quarterly requirements are less than 100 tons of carbon steel (including wrought iron), five tons of alloy steel (except stainless), 500 pounds of stainless steel; 4000 pounds of copper and copper-base alloy; and 1000 pounds of aluminum.

If your requirements are less than those, your application is being processed in Commerce Department field offices. If your requirements are more they are being processed in the Washington offices of NPA.

The field offices received 15,399 applications from small businessmen. Washington received 30,023 applications from larger companies.

Even though it is handling applications for the larger companies only, the Washington office is besieged with questions from small users which could be handled more easily in the field, NPA points out.

Sighted: More Materials

Anticipating materials supply relief in the fourth quarter, Babcock & Wilcox Co., New York, is expanding its use of subcontracted facilities. In addition it will build a new plant.

The facilities to be used on a subcontracting, or lease, basis are at Wilmington, Del., Wilmington, N. C., and Dallas. The new plant will be at West Point, Miss. The company now has six plants, located in Barberton and Alliance, O., Beaver Falls, Pa., and Augusta, Ga.

Reason for expansion, says C. H. Gay, vice president, is to have available necessary additional fabricating operations to speed production of badly needed boiler parts when anticipated increases in steel and other materials for this work become available during the fourth quarter of this year. The anticipated increases in materials are expected to result from the Controlled Materials Plan.

Blast Furnace Output Rises

Second largest monthly production this year by blast furnaces was accomplished in July.

That month's output was 6,069,754 net tons, says American Iron & Steel Institute. Only month exceeding July was May, when production was 6,173,360 tons. Output in June was 5,977,656 tons. To turn out the 6,069,754 tons in July, the furnaces operated at 98.8 per cent of capacity.

The July blast furnace production comprised 6,009,717 tons of pig iron and 60,037 tons of ferromanganese and spiegel.

Total blast furnace production in the first seven months was 41,194,037 tons.

Additional comparisons — in net tons — are in this table:

	Pig Iron	Ferro-manganese and Spiegel	Total Blast Furnace Output
1951			
June	5,919,735	57,921	5,977,656
July	6,009,717	60,037	6,069,754
7 mos.	40,767,852	426,185	41,194,037
1950			
July	5,819,186	59,759	5,878,945
7 mos.	36,626,181	386,203	37,012,384

Mesta Builds Fairless Mills

Mesta Machine Co., Pittsburgh, will build four major rolling mills for U. S. Steel Co.'s Fairless Works at Morrisville, Pa. Those units are in addition to the contract for an 80-inch hot strip mill previously announced.

The four new mills are: A 45-inch by 90-inch universal slabbing mill, a 48-inch four-stand four-high tandem cold reduction mill and an 80-inch four-high sheet temper mill. The slabbing mill is designed to roll ingots weighing up to 40,000 pounds, with a maximum width of 78 inches. The 48-inch reduction mill will roll steel strip for tin plate at speeds up to 7000 feet per minute. The 80-inch reduction unit will be powered with 21,550 horsepower. Unusually heavy power will be engineered into the temper mill, too, so it can operate at a speed higher than has been attempted previously for sheet production.

Prices Cut 37 to 73 Per Cent

Price cuts of 37 to 73 per cent on its larger diameter Rollpins have been made by the Rollpin division of Elastic Stop Nut Corp. of America, Union, N. J.

The reductions, says E. F. Nason, general sales manager, have been made possible through revisions in production processing and economies resulting from installation of new high-speed production equipment.

Covered in the reductions are Rollpins over 5/16 inch in diameter, the reductions depending on the size.

Rollpins are designed for hinge pin, yoke or clevis, and cotter-keyed applications.

Inland Plans Slab Reheater

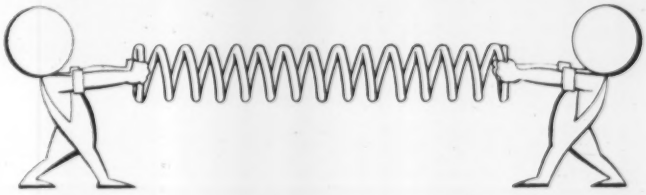
A new slab reheating furnace at its Indiana Harbor, Ind., works is on Inland Steel Co.'s schedule. Rust Furnace Co., Pittsburgh, will build the multi-fired reheater, zone-controlled, continuous type unit. It will deliver 85 tons of slabs per hour at a temperature of 2250 degrees Fahrenheit.

Alcoa Adds to Research Labs

Research facilities of Aluminum Co. of America are being expanded with erection of a new building at the company's Aluminum Research Laboratories at New Kensington, Pa.

The new unit, 80 x 170 feet, is needed to relieve congestion and extend the company's research facilities to meet increasing demands of the national defense program. Floor space at the laboratories will be increased by about one-third. The building will be ready for occupancy early next year.

Wanted: More Stretch in Price Ceilings for Springs



SOME of the stretch has been taken out of spring manufacturers by OPS rulings on prices. The pricing situation isn't helping the deliveries of springs, either. They're already extended to three months, on the average.

Products of the industry are covered under the machinery ceiling price regulation (CPR 30), but much of the industry is currently pricing under the General Ceiling Price Regulation.

Impractical—CPR 30 just doesn't work out for most spring makers because the product is rarely priced from schedule. Most are made to order, so pricing is on the basis of an individual cost. Some companies will produce as many as 100,000 different types of springs annually, all on the basis of individual specifications. The filing required under CPR 30 would be monumental.

So, the industry, along with the automatic screw machine product and metal stamping industries which have similar pricing problems, is trying to sell OPS on a formula method of pricing that would permit a continuance of the quotation system based on individual costs. It would be modeled after the castings order (CPR 60) establishing ceilings on the basis of price lists or the formula for pricing in effect Jan. 25, 1951. Chances are good that it will eventually be accepted in Washington.

Complex—The spring industry is a complicated one and consists of companies that make products roughly categorized as leaf, railroad, upholstery and furniture and precision mechanical springs. The precision mechanical springs—used in a myriad of equipment from delicate instruments to heavy machinery—make up the largest category by far. Some 350 precision mechanical spring makers did $100 million worth of business last year, 95 per cent of which was done by 80 companies. The volume will undoubtedly be higher in 1951. The leaf spring segment of the industry has about 22 companies in it; a good part of their business is for the automotive replacement market.

The largest civilian consumer of springs is the automotive industry. Other big consumers are farm implement and toy manufacturers. Steel is the metal most commonly used in springs, but Monel, brass, phosphor bronze and other nonferrous metals are also suitable. Alloy steels are the most difficult to get. Phosphor bronze is another tight material.

More Alloys—The alloy situation is unfortunate because those steels are required for much of the defense work the industry is doing, particularly on aircraft contracts. Major defense spring requirements also include gun springs, bed springs and automotive components.

A defense job that's losing some of the importance it held during World War II is for aircraft components. Then, as many as 48 valve springs were needed for some reciprocating

aircraft engines. Now, the military is shifting to jet engines which require far fewer springs.

Steel Savers

Two promising developments in concrete aimed at reducing requirements of reinforcing bars and wire mesh have resulted from research conducted by the Agricultural Research Administration.

Working with Michigan State College, the ARA found a satisfactory method of making lightweight concrete, with superior insulating properties, by substituting ¾-inch diameter corncob pellets for the conventional coarse aggregate.

And working with the National Bureau of Standards, the ARA lightened the weight of concrete by 38 pounds per cubic foot, and doubled its insulation values, by substituting air for sand in the mix.

Fanfare for Scrap Drive

Commerce Secretary Charles Sawyer will push the button that will start operating a new scrap baler at the A. Shaw Co. Inc., Cleveland. The ceremonies, scheduled for 4 p. m. Sept. 8, are to highlight the scrap mobilization program of which the Commerce Department's National Production Authority is a sponsor.

Malleable Industry in 125th Year

Malleable Founders' Society will help observe the 125th anniversary of the malleable iron industry in the U. S. when it meets Sept. 20-21 at Hotel Cleveland, Cleveland. American malleable iron was first made July 4, 1826, at Newark, N. J., by Seth Boydan, early American inventor. Today, malleable iron castings are made by 100 companies in 113 foundries located in 19 states and Canada. Nearly 40,000 workers produce more than 1 million tons of castings each year.

The meeting, aside from a tribute to the growth of the industry, will consider workers' safety and compensation, government restrictions and will include a technical discussion of shell molding processes.

Rail Steel Bar Group To Meet

The Rail Steel Bar Association will observe its 40th anniversary at its fall meeting Sept. 6 and 7 at Colorado Springs, Colo.

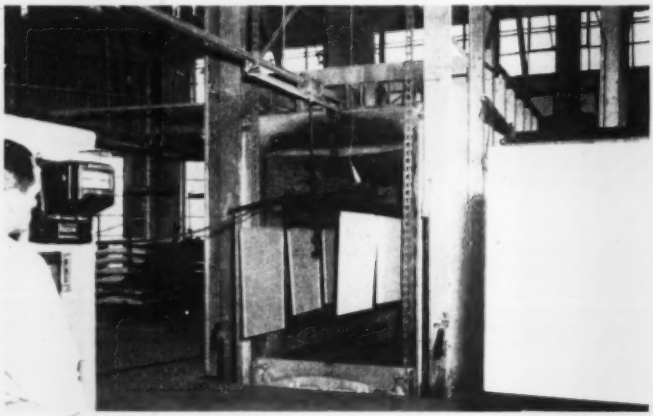
First day will be devoted to reviewing the association's past and looking into the future. The second day will be devoted entirely to discussions of present-day problems.

New Uses for Enamel

Porcelain enamelers seek 100 new applications to boost sagging production

IF THE hill will not come to Mahomet, Mahomet will go to the hill. Porcelain enamelers will use the wisdom of that proverb to find new product applications so they can boost output that's sagging because of war-born controls and shortages.

The situation is this: Less than 1 per cent of the industry's production is going for defense, but at the same time civilian business—notably in household appliances—is slackening and not more than 75 per cent of the productive capacity is being used. Those percentages vary, of course, from company to company. A few firms have as much as 35 per cent of their production going to defense and are operating at 100 per cent of capacity.



PORCELAIN ENAMEL ARCHITECTURAL PANELS ENTER FURNACE
. . . applications for defense are thus far not extensive

The Reason Why—The problem is not that porcelain enamelers aren't looking for defense business. It's that porcelain enameling applications for defense thus far developed are not extensive. Major defense applications include ceramic coatings for jet engine and other aircraft parts, coated submarine mufflers and coatings on Quartermaster Corps items where high protection against corrosion and heat are required.

To boost the 75 per cent average capacity figure, the industry's Porcelain Enamel Institute has named a New Uses Committee. The group will present at the PEI annual meeting Oct. 31-Nov. 2 in White Sulphur Springs, W. Va., a compilation of 100 new uses—both civilian and defense—for porcelain enamel.

Limited — Some industries can adapt their equipment to manufacture totally different products. Theoretically, that is possible for porcelain enamelers who can switch their furnaces to heat treating. But that requires considerable work and is expensive. The extent to which it has been done to date is small.

Shortages of frit further complicate the situation, and the total 1951 sales volume is certain to be below 1950 levels. Last year, the 400 U. S. plants in the industry—both captive and jobbing—did $500 million worth of porcelain enameling business.

Porcelain Enamelers To Meet

Sessions on testing methods, new product development and defense production problems are planned for the 13th annual shop practices forum of the Porcelain Enamel Institute. R. L. Fellows of Chicago Vitreous Enamel Products Co. is chairman of the 1951 forum, to be held at Ohio State University Oct. 10-12.

Testing methods under discussion will be thermo-shock, torsion and adherence, fish-scaling and enamel coating discontinuities. Symposia on new product development include corrosion resistance and industrial applications, processing operations in high temperature coatings and others.

AFL Withdraws from Group

American Federation of Labor has officially withdrawn from the United

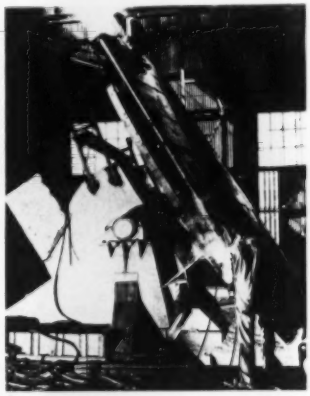
Labor Policy Committee, the organization in which both the AFL and CIO presented a united front, particularly on wage stabilization questions.

AFL's explanation of its withdrawal is that the committee "to a large extent" had accomplished its purpose.

Positioner Sales Mount

When demand for welded products rises, demand for work holding equipment follows

UP TO THEIR EARS in the armament water, makers of welding positioners for industry are finding



POSITIONING SHIP HULL ASSEMBLY
. . . makers flooded with rated orders

business buoyant these days. They're just treading water now, but expect to swim a little faster if they can lick the labor and materials cramps.

A year ago they were hardly wading. Then came the flood of orders for tanks, jet engines, heavy mobile equipment, pipelines and ships—all requiring a lot of welding operations in assembly. And whenever demand for welded products increases, demand for positioners, turning rolls and similar work holding equipment follows.

Need One?—Before Korea you could usually get a welding positioner, either manually operated or motor-driven, within 30 days from order date. Today major manufacturers report backlogs up to six months on large positioners; somewhat less on smaller equipment. Immediate delivery can still be had on small models from some manufacturers, but this is an exception to the tight supply rule.

Paradoxical it is that makers of welding positioners—a product designed to boost output while cutting labor costs—themselves can't get enough workers to buoy production to the level of the order inflow. One company has embarked on a recruiting program at county fairs to get workers from farms and small towns. Another is able to operate only one shift—with as much overtime as men are willing to work. But enthusiasm for heavy overtime schedules died quickly, and the idea of working through vacations with extra pay got a cool reception and was rejected.

CMP Helps—Virtually all of the rise in orders for positioners has been rated. As a result, producers have fared well by CMP allotments. The trouble has come in finding the materials. Copper has been the red plague to nearly all companies: They use a lot of it in motors and control equipment. The copper strike may force some curtailments in the near future. Bearings are a problem for some producers, not for others with assured supplies. Most are hard-pressed for rubber tires used in turning rolls. Steel is a major worry: Even carbon steel has been tough for one maker to get. Alloy steel from which yokes and other parts are made is scarce, as is spindle material which must be heat treated. One of the hardest items to get is plate over $1\frac{1}{2}$ inches thick for face plates.

Price ceilings have posed no great threat to production; positioners are currently bearing a 10 per cent higher price tag than a year ago. Some are higher as a few producers got under the wire with increases in December before the freeze. Present emphasis, of course, has switched from selling positioners to keeping customers happy while waiting for them.

Loan for Aluminum

Harvey Machine Co. gets government aid for aluminum plant to be located in Montana

A $16 MILLION loan to Harvey Machine Co. of Kalispell, Mont., for building an aluminum plant and alumina facilities is authorized by the Defense Production Administration.

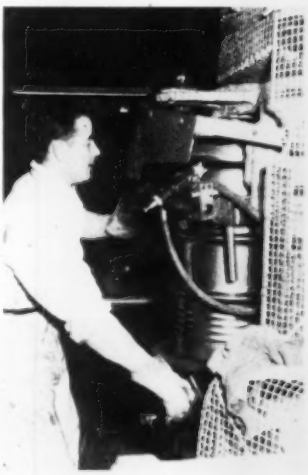
The aluminum plant is blueprinted for Kalispell. It would cost $32 million and have three pot lines capable of producing 54,000 tons of aluminum annually. Alumina facilities would be located at Everett, Wash. They would cost $11 million and have an annual capacity of 108,000 tons of alumina. The remaining $3 million would be for ore boats.

The Harvey Machine Co. of Montana is a subsidiary of the Harvey Machine Co. Inc. of (Torrance) California.

The loan which the DPA approved was recommended early in August by the Department of the Interior. The loan will be made by the Reconstruction Finance Corp. acting as agent for DPA under the Defense Production Act. The loan's terms call for a 20-year maturity from the date of the note with annual interest of 4.5 per cent.

The company is to provide an equity of $9 million. The government, through RFC, is to receive any tax savings resulting from accelerated amortization of the subsidiary company. Also, the government is to receive one-half of the net income, after taxes, of both the subsidiary and the parent company.

DPA says the new aluminum facilities are to reserve a substantial



DRUMMING UP BUSINESS: Rolling through Europe, this mobile drum factory has demonstrated production techniques at fairs and expositions for the last two years. Development of Van Leer's Vatenfabrieken, N.V., The Hague, Netherlands, the plant can turn out 1000 ten-gallon drums daily. Machinery for this self-supporting production unit is carried on 30 road vehicles and operated by a staff of ten. Here it is in operation at the World Petroleum Congress in Scheveningen, Netherlands. The mobile factory has also made appearances at the 1950 Paris Fair and at the National Packaging Exhibition in London. Such operations as shearing, rolling, welding, expanding, corrugating, seaming, and painting are performed

proportion of capacity for supplying ingots to independent fabricators without their own sources of aluminum supply. The government believes the new facilities will provide an important competitive influence in the primary aluminum industry.

Small Business Gets Half

Midcentral Air Procurement District is servicing 2405 Air Force prime contracts worth more than $2 billion in 12 midwestern states. Air Force officials report more than half this contract value is going to small businesses subcontracting prime awards.

Firms in the Chicago region alone already are working on about 1360 prime contracts valued at almost $329 million.

Flood Sets F-84 Back a Month

Air Force-General Motors Corp. F-84 Thunderjet production schedules were set back a month by the flood that hit GM's Kansas City, Mo., aircraft plant July 14. Damage to production equipment within the plant was kept to a minimum by quick action in drying and cleaning 375 machine tools with engine preheaters and steam generators. Biggest materials loss, says Lt. Col. Preston Brown, Air Force plant representative, is an instruction model F-84 that needs extensive overhauling.

AF Alters Procurement Setup

Modification of the Air Force's negotiated contracts setup may give smaller firms a chance to bid on some items previously handled by direct negotiation at Air Materiel Command headquarters.

Under the new regulation, lists of items for certain negotiated contracts of $10,000 and over are being posted by government offices, trade associations and chambers of commerce. The list—U. S. Department of Commerce Synopsis of Proposed Procurements—indicates contracts to be handled on a negotiated basis. Requests for proposals (RFP's) in these negotiated bids are available in local Air Force small business offices.

After looking over specifications, small business representatives may submit bids to Wright-Patterson Air Force Base, office of the Air Materiel Command. This office will examine facilities of firms whose bids are accepted. In most cases, items requested on RFP's are not standard.

The items usually involve research, development or initial procurement on a research and development project just completed.

SOLAR AIRCRAFT CO.'S PORTABLE HAND-STARTED GAS TURBINE
. . . the company is tooling up under a contract to make thousands

Solar Has Turbine Order; West Coast Backlogs Mount

DEVELOPMENT of a new power plant — a portable hand-started gas turbine — by Solar Aircraft Co. gives some metalworking firms a fresh source to turn to for defense subcontract work.

Navy Bureau of Ships ordered Solar to work on the new turbine to provide a better method for fighting shipboard fires. However, the Navy says a year's tests at Annapolis show it has definite advantages over steam, diesel and gasoline engines in many uses aboard ship. The company is tooling under a contract to make thousands of the units.

Another Navy BuShips research program paid off recently when Food Machinery & Chemical Corp. started work on a completely new amphibious-type tank. The vehicle will be turned out at the company's packing equipment division plant at Riverside, Calif., where it is now reconverting World War II LVT's. Under an earlier contract, the West Coast concern is making a tank-type personnel carrier for the Army.

More West Coast manufacturers, Norris-Thermador Corp. and Ryan Aeronautical Co., report mounting backlogs of orders for defense purposes. Ryan has a new $8 million contract from General Electric and Wright for J-47 and J-65 jet engine parts and an all-time high backlog of $40 million. In the last six weeks, Norris-Thermador got contracts to make ammunition components worth $15 million and President K. T. Norris says this brings the corporation's government business up to $50.5 million.

Other contracts awarded by the government, in excess of $250,000, follow. Added to these are Signal Corps awards on which no quantity or value data is furnished.

PRODUCT	CONTRACTOR
Tanks, M-47 Medium	American Locomotive Co., Schenectady, N. Y.
Minesweepers	Higgins Inc., New Orleans
	J. M. Martinac Shipbuilding Corp., Tacoma, Wash.
Construction on CVB	Newport News Shipbuilding & Drydock Co., Newport News, Va.
Tank and Combat Vehicle Parts	American Generator & Armature Co., Chicago
Power Plants (diesel electric)	Cummins Engine Co., Columbus, Ind.
Transmitters (fuel pressure)	American Machine & Metals Inc., Sellersville, Pa.
Presses	Ajax Mfg. Co., Indianapolis
Road Graders	J. D. Adams Mfg. Co., Indianapolis
Construction of Hangars, New Castle AFB, Del.	William Limker Co. Inc., Philadelphia
No quantity or value data is furnished on the following:	
Power Units	John R. Hollingsworth Corp., Clifton Heights, Pa.
	Kohler Co., Kohler, Wis.
	Alliance Mfg. Co., Alliance, O.
	United States Motor Corp., Oshkosh, Wis.
	Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Generators (2 contracts)	Jacobsen Mfg. Co., Racine, Wis.
Motors and Generators	Electric Products Co., Cleveland
Radio Sets	Admiral Corp., Chicago
	Barker & Williamson Inc., Upper Darby, Pa.
Coils, Transformers and Reactors	Chicago Transformer Div., Essex Wire Corp., Chicago
Radio Transmitters	Radiomarine Corp. of America, New York

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

LABORATORY PRIORITIES — Amendment of Aug. 23, 1951, of NPA Order M-71 liberalizes restrictions on production runs of certain laboratory experimental models.

CANS—Amendment of Aug. 23, 1951, of NPA Order M-25 sets the pattern of production and use of cans for the 12 months beginning Oct. 1, 1951. This amendment puts the operation of M-25 on a 12-month basis instead of a quarterly one to provide more flexibility in meeting seasonal can requirements and to permit long-range planning.

PIPE—Amendment of Aug. 24, 1951, of Direction 3 to NPA Order M-6 is designed to aid the Missouri-Kansas-Oklahoma flood area. It directs steel producers to ship standard and line pipe during September to distributors serving the flood area at a rate of 130 per cent of the distributor's monthly base period rate of use. Normal permitted rate is 85 per cent. This "bonus" pipe — the amount between 85 per cent and 130 per cent—is to be sold only to purchasers who certify they will use it for repairs of flood-damaged equipment or property.

METHYLENE CHLORIDE — Schedule 9 to NPA Order M-45 places methylene chloride under government allocation Sept. 1, 1951. Schedule 9 was issued Aug. 29, 1951.

METHYLENE CHLORIDE — NPA Order M-21, which restricted use of methylene chloride and gave preference to certain defense-rated orders, was revoked Aug. 29 because it is superseded by Schedule 9 to NPA Order M-45.

Price Regulations

MACHINERY—Amendment 8 of Ceiling Price Regulation 30 redefines the term "manufacturer" as it relates to brand names under CPR 30 (Machinery and Related Manufactured Goods). Sellers who are removed from coverage of CPR 30 by this amendment will determine their ceiling prices under the General Ceiling Price Regulation. Amendment 8 was effective Aug. 27, 1951.

BRASS MILL PRODUCTS — Ceiling Price Regulation 68, effective Aug. 23, 1951, establishes ceiling prices for brass mill products (plate, sheet, strip, rod, bar, tube, pipe, extrusion, anode, other shapes made from copper or copper-base alloy, non-electrical wire made from copper-base alloy, and welding rod made from copper or copper-base alloy). The regulation does not include fabricated commodities made from brass mill products or any copper alloy product produced by a copper refiner or smelter.

WELDING WIRE & ROD — Amendment 9 of Ceiling Price Regulation 30 removes copper and copper-base alloy welding rod and welding wire from Ceiling Price Regulation 30 (Machinery), since these products are covered now under the brass mill products regulation, CPR 68. Amendment 9 was effective Aug. 23, 1951.

EXPORTS—Amendment 1 to Ceiling Price Regulation 61 gives the producer-exporter an alternative domestic ceiling price to be used in computing his ceiling price for export sales. Amendment 1 was effective Aug. 28, 1951.

NPA Regulation

APPEALS—Amendment of Aug. 29, 1951, of NPA Reg. 5 specifically authorizes the NPA Appeals Board to act on cases involving CMP allotments and materials allocations, as well as on cases concerning other orders and regulations of NPA.

DEADLY PYRAMID: This factory, established on the outskirts of Amsterdam, The Netherlands in the 17th century, is busily turning out ammunition and hand grenades for modern armies of the North Atlantic Treaty Organization. The Artillerie-Inrichtingen was almost totally destroyed during the second World War

Help for Machine Tool Builders

The machine tool industry's defense production production program got two more lifts from the government.

One is the allotment of an average of 25 per cent more steel, copper and aluminum for the fourth quarter of this year than for the third quarter. The other is a simplification of procedure for repaying cash advances by machine tool makers participating in "pool" orders.

The Metalworking Equipment Division of the National Production Authority is sending out tickets now for fourth-quarter alloments of steel, aluminum and copper to machine tool builders. While some builders will get no more steel in the fourth quarter than in the third, others will receive as much as 50 per cent more, depending on their needs. The increase will average 25 per cent for the machine tool building industry as a whole.

The allotment increases do not apply to steel plate and structurals, but NPA believes that tool builders will be able to get by through increases on other products and by using their ingenuity.

Under the simplification of procedure for repaying government cash advances under the "pool" order program, machine tool builders will be permitted to pay back the advances as each tool covered by them is sold. The builders then will pay interest only on outstanding advances.

The two additional aids to machine tool builders are in line with the government's increased recognition that tools are one of the first necessities in a defense program.

More Steel for Can Makers

Can makers are to be allocated more steel in the 12 months beginning Oct. 1 than they ever have used in a year, the National Production Authority announced. Allocations will total between 4 million and 4.4 million tons. In 1950, mill shipments of steel to can makers totaled 4,006,284 net tons.

Offsetting projected high production, however, is the growing need for more and more cans.

Windows of Washington

By E. C. KREUTZBERG Washington Editor

Congress probably won't authorize ceilings on profits—as the President wants—by repealing the Capehart and Herlong amendments to the Defense Production Act

TO KEEP from getting blamed for the inflationary whirligig come election time in 1952, the President is seeking to repeal the Capehart and Herlong amendments to the already amended Defense Production Act.

Those amendments allow manufacturers and distributors to raise prices enough to cover increases in costs since Korea—thus assuring them of the profit margin they enjoyed before. The amendments were introduced and approved after it became apparent that the administration was following a policy of cutting the profit margins.

Cold Shoulder—The President's request for repeal of the amendments naturally couldn't get a warm reception in Congress. He just waited too long to use his anti-inflationary powers under the original Defense Production Act. The issue on profit margins was thoroughly thrashed out when the act was extended in amended form. So there is little likelihood that Congress will authorize ceilings over profits while the farmer has his parity price formula and the laboring man is assured of wage increases geared to cost of living.

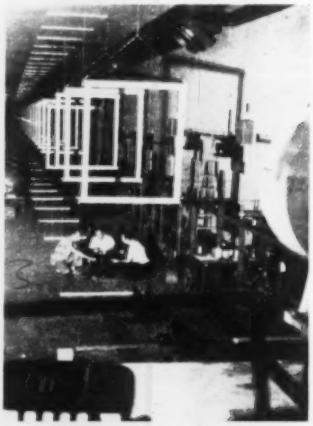
Indications are that Congress will not force manufacturers and distributors to join the fixed-income people (pensioners, annuitants, etc.) as the only segments of the economy to make sacrifices on the altar of inflation.

Report on Machinability . . .

Data on machinability of high-temperature alloys is available in the 161-page book "Air Force Machinability Report, 1950." It is a preliminary report on a U. S. Air Force contract program (started in 1948) to determine the lowest cost and most productive methods of machining high temperature alloy, cast iron and cast steel. Summary of the study was compiled in book form by Curtiss-Wright and there was limited distribution of the material several months ago. STEEL published one of the sections Mar. 12, 1951, p.80. Now you can get copies of the entire report for $2.40; send your orders to Curtiss-Wright Corp., Woodridge, N. J., to the attention of R. T. Hurley. Chapter headings are: How To Analyze the Machining Process; Metals Under the Microscope; Getting the Most Out of Machines and Tools; Machining Jet-Engine Alloys; Cast Iron; Microstructure and Machinability; Steel Microstructure Determines Tool Life.

Strictly Confidential . . .

A special booklet prepared by the Munitions Board answers the often-perplexing question: How do I go about getting clearance for receiving and handling "confidential" and "secret" information? The question is answered in "How to Be Cleared for Handling Classified Military Information within Industry." It was drafted for the assistance of companies needing confidential or secret information about military requirements to bid on contracts. It explains what classified information is, what is meant by "clearance," who gives clearances, what the clearances cover, how employees are cleared, etc. Cost of the booklet is 10 cents. You can get it from the Superintendent of Documents, Government Printing Office, Washington 25.



FRAMES FOR FLIGHT: Projectiles passing through these electronic frames automatically set off a battery of cameras to record the missiles' flight. This is only one phase of work in progress at the $35 million Naval Ordnance Laboratory, White Oak, Md. Here research enters new realms of precision, size and speed. The lab boasts such equipment as a rolling mill, brought from Germany after the war, that can roll metal strips down to two-tenths of a mil in thickness; a 10-million volt machine capable of taking x-ray photographs through 14 inches of steel to detect flaws; a betatron; and hypersonic wind tunnels that can achieve air speeds corresponding to some 7000 miles per hour. The lab's staff includes 950 scientists and engineers on its roster of 3000

No One Will Fall Out of Line . . .

A Senate-approved bill that likely will pass the House would penalize up to $5000 and five years in jail any government official found guilty of firing, demoting or denying promotions to any other government official in reprisal for unapproved testimony to a congressional committee. No one expects the bill to end the custom of handing loaded or incomplete stories to Congress.

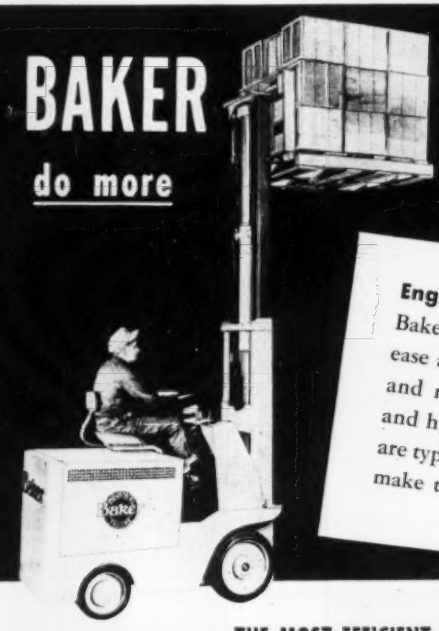
Just as there's more than one way to skin a cat, there are several ways for terminating an official's career without disclosing motive. So, no government career man who values his job—and most do despite their talk about higher pay in private employment—is going to get out of line.

Tooling Up NATO . . .

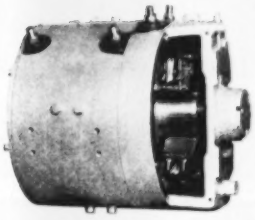
Andrew R. Benedictus was taken on by the Office of International Programs, Munitions Board, to become a member of the NATO Countries Defense Production Board, headquartering in London. His duties will be concerned with the machine tool end of western European rearmament.

BAKER FORK TRUCKS

do more work per dollar invested



Engineering genius has developed the new Baker line of Fork Trucks for maximum utility, ease and economy of operation, low first cost and minimum maintenance. The electrical and hydraulic components illustrated below are typical of the many built-in features which make this possible.



THE MOST EFFICIENT MOTORS FOR INDUSTRIAL TRUCKS

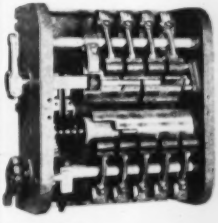
1. Baker designed and built for severe industrial truck service.
2. Cost less to operate because of higher efficiency.
3. Dynamic balanced T-slot armatures wound with rectangular wire for maximum copper in smallest space.
4. Develop highest horsepower for any motors their size and weight because of extra copper.
5. Cool running—can be damaged only by most severe abuse.
6. Heavy forged commutator bars—large brush surfaces for longer life.

THE PRACTICAL HYDRAULIC SYSTEM FOR INDUSTRIAL TRUCKS

1. Low-pressure hydraulic system—less subject to oil seepage than high pressure systems.
2. Danger of dropping heavy loads effectively reduced.
3. Operator-controlled metering valves give positive control of lifting and lowering.
4. Oil by-passed to reservoir at travel limits for greater safety.
5. Efficient Baker motor, designed for this function, drives the hydraulic pump.
6. Gear-type pump for greatest efficiency.

THE SAFEST CONTROLLER FOR INDUSTRIAL TRUCKS

1. Exclusive Baker 2-drum, NoPlug, Electric Dynamic Braking Controller.
2. Engineered for maximum protection to battery, motor, drive axle, truck and operator.
3. In decelerating, truck acts as prime mover, motor as generator, to achieve *Dynamic Braking*.
4. Dynamic braking saves wear on mechanical brakes and provides added safety when descending ramps.
5. Advancing through five steps necessary in accelerating to top speed.
6. Plugging impossible when changing travel direction.
7. Speed selection by foot accelerator for operator convenience.
8. Travel direction selected by lever on dash.



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So you're going to a CONVENTION

STEEL

HERE ARE some tips that will help you get the most out of the big convention season ahead

By JOHN S. MORGAN, *Associate Editor*

AT LEAST one metalworking company has a vice president in charge of attending conventions.

He has no sinecure; his firm, which manufactures a diverse product line, considers him an important official. He attends about 15 affairs a year, and when he's not at one meeting he's carefully laying the groundwork for his attendance at the next, to promote his company's product, to get information about conditions in another field in which his company operates and to find solutions to problems in that field which his firm may share with others.

You, Too—You may not go to 15 trade conventions or shows a year, but the odds are that you'll take in at least one. An investment of the three days and $150 you'll probably put into it can pay rich dividends—if you plan your expenditures as carefully as you would buy better equipment or the new office carpet.

For trade conventions have answers to give in return for your time and money, answers coming from the combined experiences of the delegates about how to interpret the latest government regulations, what you can substitute for scarce materials, how you can get defense subcontracts, how you can improve your cost accounting system. Those meetings offer good times, too, but their real business is trouble. Proof is the fact that the greatest attendance and interest at conventions and shows has always occurred in troublous times, during the depression of the 1930s, after the end of World War II—and now.

Big Business—An estimated 10 million people or more will attend the 20,000 conventions of all types to be held in the coming season which will see most of its activity from mid-September to next June 1. About one-third of those 20,000 gatherings will be religious, social or labor. About 2500 of those 20,000 will be important to business, being sponsored by trade or professional associations. Of those 2500, more than 800 will have exhibits or will be trade shows. About 500 of those 2500 will be metalworking conventions or shows and will have an attendance of at least 250,000.

Those quarter of a million people will spend at least 750,000 man-days and $37.5 million at metalworking conventions. How can you as a delegate help assure that that time and money will be well spent? Much of the success of a trade convention or show is up to you, not to the people running the affair. Here are some of the things you can do to get more out of your next trade meeting:

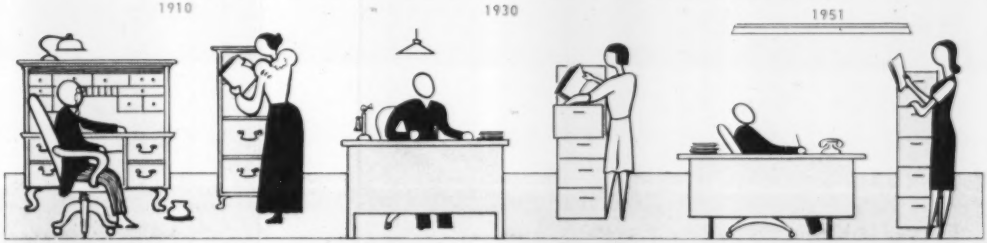
Let the trade association know your problems. That's the best way for the group's program committee to plot the convention agenda. That's the best way, too, to assure yourself that part of the program, at least, will directly concern your interests.

Prepare an advance memo of the questions you want answered, the problems you want aired. That will be a reminder to you in any panel discussion or corridor shop talks to find out what you want to know. That will help keep your panel discussion questions pertinent.

Register in advance, if at all possible. That saves the time of both you and the association staff. If you can't register in advance, do so as early as possible at the meeting to avoid the long waits.

Don't change your mind about the various events you sign up to attend when you register. One of the biggest headaches for the administrative people at conventions is the plan-changer, the fellow who at the last minute finds he cannot attend the plant visitation Wednesday afternoon but will, after all, be able to make the night club party Wednesday evening. Above

National Trade Associations Increase Five-Fold in 40 Years



	1910	1930	1951
NO. OF TRADE ASS'NS:	250	900	1500
POPULATION:	92 Million	123 Million	154 Million
NO. OF FIRMS:	2.1 Million	3 Million	4 Million

Source: Department of Commerce, Trade Association Division

everything, if you register in advance, don't change your mind about attending the event.

Make sure about hotel reservations at least two weeks in advance, even further ahead if the meeting is large.

Look the convention program over in advance. You can get advance copies from the associations; business magazines carry program details of the larger gatherings. It's particularly important to do that for big meetings where several things may be going on at once so you can decide what to attend. That's just one device to help you to budget your time better.

If you take your wife, see that she comes equipped with the required membership cards and other credentials for the various women's activities. If you don't want to take her, tread warily. The old refrain of "no women allowed, dear, at this affair" is passe. Many associations now are encouraging delegates to take their wives. Their presence is thought to contribute to saner, more business-like gatherings.

Be on time at the meetings. But don't be like one delegate last fall who arrived at an Atlantic City affair precisely one year too early. His association, a forehanded outfit, sent out its 1951 schedule in 1950 and one member got the years mixed. Likewise, if you're neither too early nor too late and the meetings don't start quickly, you have a legitimate complaint. Also, once you have arrived at the convention, attend the sessions. What else are you there for?

Be careful about your entertainment. If you or your company are throwing a cocktail party, be sure that it doesn't conflict with any convention sessions. Be certain, too, that it doesn't drag on.

Be moderate in your convention business and pleasure. The good-time-Charley convention days are as out of date as the speakeasy, but nobody wants a convention atmosphere of unmitigated gloom either.

If you're a technical man, don't devote all your time to the technical papers. If you're in sales, don't ignore the technical phases of the meeting altogether.

Participate in the affair as much as possible. In question periods, ask pertinent questions, but don't hog the show. Don't dare everyone to educate you about the business. Nobody will accept the dare.

Take notes on what you see and hear. It's wise to write a report when you return.

Know in advance something about the major speakers. That will help you and may eventually help further the trend against that curse of too many conventions, the long-winded introduction.

Talk shop with other people attending the meeting. You may get as much from them as from formal sessions.

Finally, let the association know what you disliked or liked—especially liked—about the meeting. Do it after the affair is over. Did you like the city, the date, the hotel? Did you like the panel discussion, and do you want even more from now on? Were there too many speakers at the affair? Would you just as soon drop the plant visitation next time? At the next meeting do you want at least one speaker on a subject of general interest, and not all of them to deal with your trade's economic, production and technical problems as they did this time? Was the amount of free time allotted adequate in which to conduct your private social and business affairs? Was the program for wives satisfactory?

Prepared—The checklist just given won't help, of course, if a convention is badly managed from the start by the trade association. But inept administration is a rarity these days because trade associations are big business. No fewer than 1500 national groups exist in the U. S. today. Take a look at the table on page 69 and you'll see their increasingly important role in the American economy since 1910. The metalworking segment in the trade association field has some 400 national organizations; 550 if the closely related transportation associations are added. Those associations sponsor more conventions than any other trade group. Food industry organizations sponsor the second largest number (see chart).

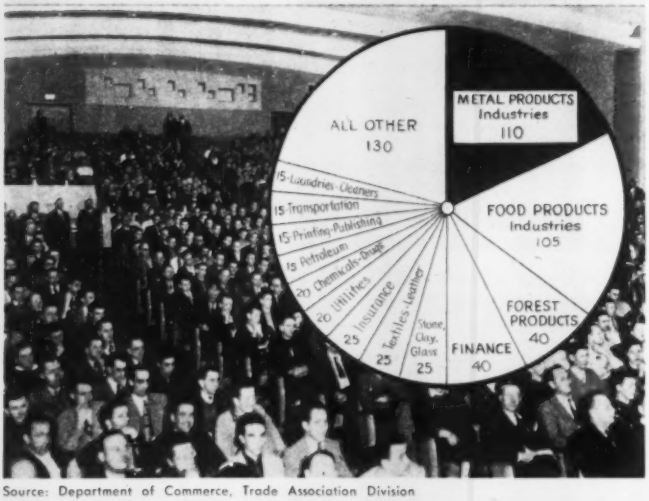
There is even a trade association of trade associations — American Trade Association Executives, Washington. The U. S. Department of Commerce's Office of Domestic Commerce has a Trade Association Division. The Chamber of Commerce of the U. S. has a Trade Association Division. So important has the trade show phase of the convention industry become that a central agency has developed to deal with that aspect, Exhibitors Advisory Council, New York. All that attests to the importance of the trade association, which has become one channel through which American business elects to operate. A major activity of all such associations is the convention or show.

Old-Timer — Trade associations — and their corollary conventions—date almost as far back as civilized man. But American associations and conventions as we know them today evolved around 1915 or 1920. The NRA period of the 1930s saw a great spurt in trade association formation because the program forced companies to form associations to represent them. NRA had to be abandoned, but the trade associations and their conventions stayed.

You'll help assure that they'll continue to flourish if, as association officials put it, you remember that what you put in you'll get out—with dividends.

Metalworking: Biggest Convention Industry

(Number of conventions held by industries in a typical quarter)



Source: Department of Commerce, Trade Association Division

CALENDAR OF MEETINGS

SEPTEMBER

September 5-7, American Hot Dip Galvanizers Association Inc.: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Association address: 2311 First National Bank Bldg., Pittsburgh. Secretary: Stuart J. Swensson.

September 6-7, Rail Steel Bar Association: Semi-annual meeting. The Broadmoor, Colorado Springs, Colo. Association address: 38 S. Dearborn St., Chicago. Secretary: W. H. Jacobs.

September 10-14, International Foundry Congress: Brussels. Address: General Secretary, Foundry Congress, c/o Fabrimetal, 17 Drapiers St., Brussels.

September 10-14, Instrument Society of America: National instrument conference and exhibit. Sam Houston Coliseum, Houston. Society address, 921 Ridge St., Pittsburgh 12. Secretary: Richard Rimbach.

September 10-15, Annual Industrial Engineering Conference: Mechanical Department, Industrial Engineering Division, Michigan State College, E. Lansing, Mich.

September 11-13, Society of Automotive Engineers: Tractor meeting, Hotel Schroeder, Milwaukee. Society address: 29 W. 39th St., New York. Secretary: John A. C. Warner.

September 12, Steel Kitchen Cabinet Institute: Fall meeting, Hotel Cleveland, Cleveland. Institute address: Engineers Bldg., Cleveland 14. Executive secretary: S. S. Keeney.

September 14-16, American Society of Sanitary Engineering: National convention, Hotel Statler, Detroit. Society address: 1308 Freemont St., McKeesport, Pa. Secretary: T. M. Dugan.

September 17-19, Allied Railway Supply Association: Fall meeting and exhibit, Hotel Sherman, Chicago. Association address: Box 5522, Chicago 80. Secretary: Charles F. Weil.

September 21-23, National Association of Waste Material Dealers Inc.: Fall meeting, Saranac Inn, Upper Saranac Lake, N. Y. Association address: 1109 Times Bldg., New York 18. Secretary: Clinton M. White.

September 24-25, Steel Founders Society of America: Fall meeting, The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland 15. Secretary: F. Kermit Donaldson.

September 24-25, American Coke & Coal Chemicals Association: Annual fall meeting, Skytop Lodge, Skytop, Pa. Association address: 711 14th St. NW, Washington. Executive secretary: Samuel Weiss.

September 24-26, National Truck Body Mfrs. & Distributors Association: Annual convention and suppliers exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 346 Connecticut Ave. NW, Washington. Secretary-manager: Shipley D. Burton.

September 25-28, American Society of Mechanical Engineers: Fall meeting, Hotel Radisson Minneapolis. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

September 27-30, Multiple V-Belt Drive & Mechanical Power Transmission Association: Annual meeting, The Broadmoor, Colorado Springs, Colo. Association address: 7 W. Madison St., Chicago 2. Executive Secretary: Harry P. Dolan.

OCTOBER

October 1-2, American Machine Tool Distributors Association: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

October 1-4, Association of Iron & Steel Engineers: Fall meeting, Sherman Hotel, Chicago. Association address: 1010 Empire Bldg., Pittsburgh. Managing director: T. V. Ess.

October 2-4, Society of Industrial Packaging & Materials Handling Engineers: Exposition and "short course," Hotel Cleveland, Cleveland. Society address: 20 W. Jackson Blvd., Chicago. Secretary: H. E. Brill.

October 3-5, Pressed Metal Institute: Fall meeting, Drake Hotel, Chicago. Institute address: 13210 Shaker Square, Cleveland 20. Managing director: Orrin B. Werntz.

October 8-12, National Hardware Show: Grand Central Palace, Atlantic City, N. J. Managing director: Frank Yeager.

October 8-13, Concrete Reinforcing Steel Institute: Fall meeting, Grove Park Inn, Asheville, N. C. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

October 9-12, The Electrochemical Society Inc.: Centennial—Fall convention, Hotel Statler, Detroit. Society address: 235 W. 102nd St., New York 25. Secretary: Henry B. Linford.

October 11, American Iron & Steel Institute: Regional technical meeting, Hotel Warwick, Philadelphia. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

October 12-14, Metal Treating Institute: Annual meeting, Detroit. Institute address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

October 13-14, American Welding Society: Annual meeting, Book-Cadillac Hotel, Detroit. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

October 13-14, American Society for Metals: Annual seminar, Hotel Statler, Detroit. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 13-17, Packing Machinery Manufacturers Institute: Fall meeting, Mid Pines Club, Southern Pines, N. C. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

October 14-18, American Hardware Manufacturers Association: Fall meeting, Marlborough - Blenheim Hotel, Atlantic City, N. J. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

October 15-19, American Society for Metals: National Metal Congress & Exposition, Statler Hotel, Detroit and Michigan State Fairgrounds. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 15-19, The World Metallurgical Congress: Hotel Statler, Detroit. Sponsored by American Society for Metals. Manager: W. H. Eisenman; director: Dr. Zay Jeffries.

October 19-20, American Society of Tool Engineers: Semi-annual directors' meeting & south-central regional meeting, Vendome Hotel, Indianapolis. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

October 22-24, American Mining Congress: 1951 metal and nonmetallic mineral mining convention, Biltmore Hotel, Los Angeles. Congress address: Ring Bldg., Washington 6. Secretary: Julian D. Conover.

October 22-24, American Standards Association: Annual meeting & national standardization conference, Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York. Secretary: G. F. Hussey Jr., Adm., USN, Ret.

October 22-25, American Institute of Steel Construction Inc.: Fall meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbott Post.

October 22-25, The Wire Association: Annual convention, La Salle Hotel, Chicago. Association address: 300 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

October 22-26, American Association of Electrical Engineers: General fall meeting, Hotel Cleveland, Cleveland. Association address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

October 25-26, Gray Iron Founders Society Inc.: Fall meeting, Edgewater Beach Hotel, Chicago. Society address: 210 National City—E. 6th St. Bldg., Cleveland. Executive vice president: Donald H. Workman.

October 28-30, Conveyor Equipment Manufacturers Association: Fall meeting, The Homestead, Hot Springs, Va. Association address: 1129 Vermont Ave., Washington 5. Executive vice president: R. C. Sollenberger.

October 29-31, American Gear Manufacturers Association: Semi-annual meeting, Edgewater Beach Hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Secretary: Newbold C. Goin.

October 31-November 2, Foundry Equipment Manufacturers Association: Fall meeting, The Homestead, Hot Springs, Va. Association address: Engineers Bldg., Cleveland 14. Executive director: Arthur J. Tuscany.

October 31-November 2, Porcelain Enamel Institute Inc.: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 1010 Vermont Ave. N.W., Washington 5. Secretary: Edward Mackaser.

NOVEMBER

November 1-2, Industrial Management Society: Annual time-motion study and management clinic, Sheraton Hotel, Chicago. Society address: 35 E. Wacker Drive, Chicago 1.

November 1-4, National Tool & Die Manufacturers Association: Annual convention, Statler Hotel, St. Louis. Association address: 906 Public Square Bldg., Cleveland. Executive secretary: George S. Eaton.

November 4-7, National Screw Machine Products Association: Fall meeting of committee, directors and executive groups, The Homestead, Hot Springs, Va. Association address: 13210 Shaker Square, Cleveland 20. Secretary: Margaret Ballinger.

November 7-9, National Machine Tool Builders Association: 50th annual meeting, The Homestead, Hot Springs, Va. Association address: 10525 Carnegie Ave., Cleveland. Secretary: Frida F. Selbert.

November 8-10, Steel Founders Society of America: T & O conference, Carter Hotel, Cleveland. Society address: 920 Midland Bldg., Cleveland. Secretary: F. Kermit Donaldson.

November 9, American Iron & Steel Institute: Regional technical meeting, Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

November 12-15, National Automatic Merchandising Association: Convention & exhibit, Public Auditorium, Cleveland. Association address: 7 S. Dearborn St., Chicago 3. Executive director: Clinton S. Darling.

November 12-16, National Electric Manufacturers Association: Annual fall meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

November 15-16, The Magnesium Association: Fall meeting, Biltmore Hotel, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: Martha I. Hanson.

November 19-20, National Metal Trades Association: Annual convention, Palmer House, Chicago. Association address: 122 S. Michigan Ave., Chicago 3. Commissioner: Homer D. Sayre.

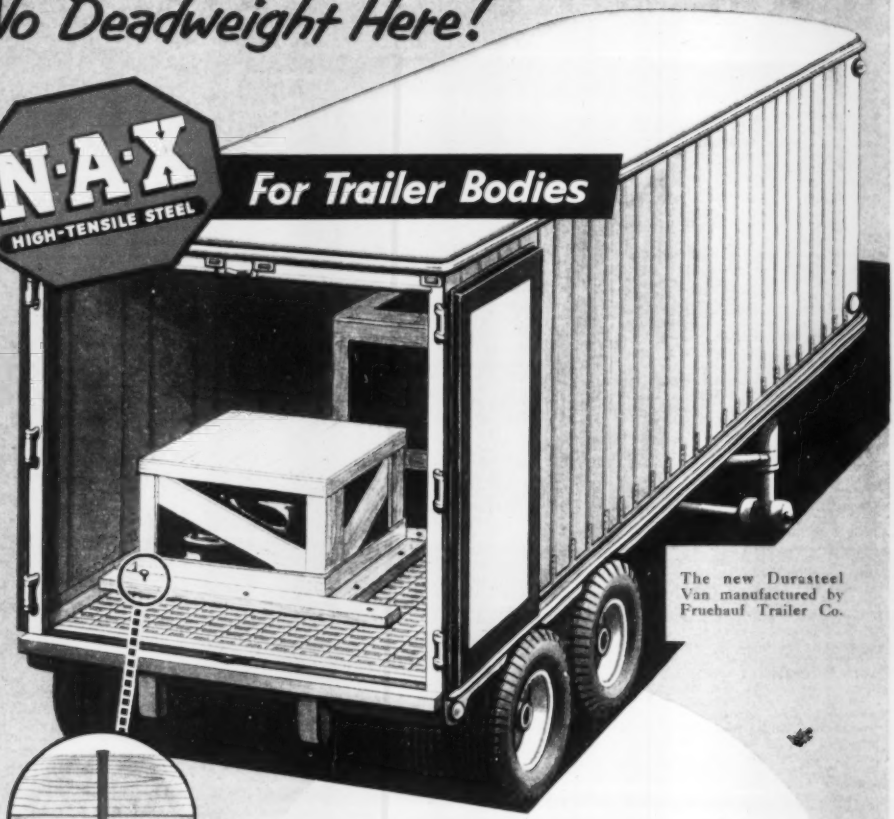
November 26-December 1, Chemical Industries Exposition: Grand Central Palace, New York. Manager: Charles F. Roth, International Exposition Co., New York; chairman: E. R. Weidlein, Mellon Institute.

November 29, American Iron & Steel Institute: Regional Technical meeting, Hotel Cleveland, Cleveland. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

No Deadweight Here!

N-A-X
HIGH-TENSILE STEEL

For Trailer Bodies



The new Durasteel Van manufactured by Fruehauf Trailer Co.

*Great Lakes' Stran-Steel Flooring has high strength and light weight. Its patented nailability permits safe blocking of loads. You distort the nail . . . not the floor.

America's first all-steel trailer body is on the highways—roof, sides, framing and flooring,* all of N-A-X HIGH-TENSILE steel. Years of planning, testing and research went into this unique trailer body, making it the most serviceable ever built.

1. The use of N-A-X HIGH-TENSILE steel in this equipment results in light weight with strength and durability.
2. In addition to greater strength, N-A-X HIGH-TENSILE steel has greater resistance to fatigue, impact, corrosion and abrasion. It offers a greater strength-to-weight ratio with longer life and larger payloads.

More and more of America's highway equipment manufacturers are swinging to N-A-X HIGH-TENSILE steel. Millions of on-the-job miles have proved the superior qualities of this steel . . . have proved its over-all economy.

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It's your SCRAP that makes your STEEL
Keep it moving to your scrap dealer

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Continental Motors expects this fiscal year's sales to be two-thirds greater than in 1950. Civilian business is still bread-and-butter but defense output is rising

DETROIT

BEHIND the matter-of-fact announcement by C. J. Reese of Continental Motors Corp. that the company in this fiscal year expects to have sales two-thirds greater than in 1950 lies a story of product development, interest in customers' needs, and intense engineering effort. High point of the story concerns military engine pioneering and production.

But that isn't the company's only interest. Its engines are used in so many types of equipment and vehicles as to be impractical of listing. Farm implements, trucks, construction apparatus, aircraft, pumps, boats, generator sets are only a few. Agricultural engines last year accounted for the largest slice of sales, at 33 per cent; truck, bus and automobile engines for 19 per cent and industrial engines for 14 per cent. Service parts, machine products, military, aircraft and marine engines made up the remaining 34 per cent.

Bread and Butter—Though its commercial engines are and will continue to be its bread and butter, military engines account for a sizable portion of the present $250 million order backlog.

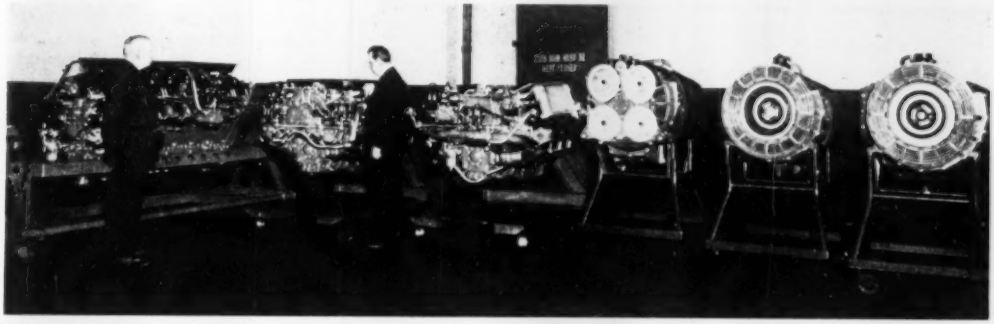
Best known of the company's military engines is the 810-hp V-12 aircooled unit which powers the General Patton medium tank. That's one of six Continental engines which the Ordnance Department has adopted as standard for frontline vehicles. Production of two others, a 500-hp job for the Walker Bulldog, and a 375-hp engine for lighter vehicles, is now stepping up. These two are six-cylinder horizontally opposed engines, the more powerful getting its boost from a supercharger. Yet to come is another V-12 developing 1040 hp, and two more horizontally opposed jobs, the smaller developing 125 hp. Only two basic cylinders are used throughout.

Mission Accomplished — That high degree of interchangeability is one of the most striking features of the engines. As developed by Continental over a five-year period during and after World War II, it far surpasses Ordnance's goal of 50 per cent standardization of high-mortality parts. It is the antithesis of conditions existing in the last war when the cry was *engines, more engines* and the services wound up with a heterogeneous assortment of aircraft radials, beefed-up automotive V-8s and combinations which had the supply depot people frantic stocking parts.

At present, lack of engines is the thought furthest from Ordnance's mind. Continental is producing them far faster than tank builders can absorb them. The imbalance won't last forever, however, and Chrysler is tooling up the Michaud plant at New Orleans for the V-12, 810-hp job.

From Baby Food to Engines—Continental's tank engines are the exclusive product of a government-owned plant at Muskegon which Continental activated in 1948. Though sought by two automakers, the government hung on to the facility, leasing it out to a baby food manufacturer, whose mountains of strained pap had to be moved out after Continental took over. Capacity is being increased through addition of equipment in certain bottleneck departments; new nitriding furnaces are being added; the cafeteria gave way to a complete gear-making shop.

Down the hill from the Military Engine Division plant, in the main Continental facility the company has begun production of a new series of air-cooled engines for the Air Force. Known as the "Packette" line, those were developed after the company won a competitive design contest for engines to be used in AF ground installations. Six models, ranging from 15 to 250 hp and using 1, 2, 4, 6 and 8 cylinders, are included. All but the one-lunger have horizontally opposed cylinder placement and all are military adaptations of certain



CONTINENTAL CONTRIBUTION: These six engines have been developed exclusively for military use by Continental Motors. Here they are inspected by Continental executives A. B. Willi and Guy J. Harinton. The three engines at left are for tanks and other front line vehicles. The three others are designed for Air Force ground installations

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models in Continental's standard aircraft engine line. At present two 4-cylinder and one 6-cylinder models are in production.

Minimum of Tooling — Because of similarity to standard aircraft engines, one model of which goes into the military's 19 observation and liaison plane, the Packettes are being built with a minimum of new tooling. Interchangeability of parts again is a key feature of the engines. Other features are their ability to start at −65° F, an automatic load-sensing governor to change speeds as applied load varies, and acceptance of a wide range of gasoline octane ratings.

Most impressive application of the new engines is to power aircraft refueling pumps. Air Force use of the B-36 made mandatory a faster means of getting gas into the plane. Refueling was taking eight hours with conventional equipment. "Jack" Reese says a Packette engine pumps the B-36 full of gas in 20-25 minutes.

Coming Up — Indications are that that series of engines will have wide industrial uses when military demands have been satisfied. Their light weight and compactness would seem to make them naturals for mobile use. Couple this with their self-contained gasoline-burning heating system which preheats the engine, and with their economy of operation, the direct result of the load-sensing governor, and you can see why Continental people are enthusiastic.

The governor is unique. Under noload conditions the engine runs at a predetermined low speed. As load is applied and makes itself felt in manifold pressure, engine speed increases up to maximum horsepower where it is capable of running continuously. When load on the engine is constant a manual means for locking the governor at any desired speed setting from 1500 rpm to 3200 rpm is provided.

Another Trim Finish Tried

Alternatives to the conventional copper - nickel - chrome finish for automotive trim continue to be developed. Most promising one yet to hit the industry is the so-called "white brass" zinc-copper alloy (STEEL, Aug. 6, p.57).

Another with which work is being done experimentally consists solely of a coating of aluminum, hot-dip applied to strip steel, zinc die castings, gray iron castings, and other forms. No bonding agent is required to obtain adhesion, the system's requisite is a metallurgically clean surface. The coated piece can be drawn or otherwise formed without damage to the aluminum surface. Needing only a clear lacquer to retain its brightness, the finish may prove suitable for bumpers and grilles. Applied to a smooth surface it develops considerable luster and promises to stand up in use better than aluminum paint. One current application is casement window handles.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,879
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,673	897,853
Six Mos.	4,137,195	3,941,878
July	527,502*	746,801
August		842,335
September		760,847
October		796,010
November		833,784
December		671,622

Week Ended	1951	1950
Aug. 4	117,010	175,572
Aug. 11	97,351	182,965
Aug. 18	129,661	190,879
Aug. 25	139,115	179,042
Sept. 1	141,000*	188,072

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Auto Demand Turns Upward

In recent weeks several automotive executives have sounded a warning against an impending car shortage. Large field stocks and lagging retail sales for a while gave the threat a hollow sound. But a rise in new car sales tempo has now become clearly discernible.

The change in conditions is being officially recognized by National Automobile Dealers Association which represents about 90 per cent of the industry's retail outlets. Last week this group presented the results of a study based on three factors—auto production, registration and population. Expected changes in the ratio between these factors, NADA predicts, will result in a car shortage soon.

Production is off, there's no question. Figures for July compiled by the Automobile Manufacturers Association show that factory sales were at the lowest ebb in 18 months, were more than 20 per cent under June and 30 per cent below July, 1950. While factory sales and production are not exactly identical, the former comes reasonably close to showing what is happening on the assembly line. There is no likelihood that any rise in production will be permitted next year. In fact the possibility is definitely present that further cuts will be ordered.

Further impetus to demand is given by the probability of a price rise. Permission to up prices was expected from OPS late last week. It is guessed that price tags will go up $100-$150 on low and medium priced models.

Ford Local Protests Move

You can't move an operation out of Detroit without getting in dutch with your union local. Ask Ford. UAW Local 600, the largest local in unionism, and somewhat of a renegade in the UAW's organization, has asked the international body to sanction a strike against the Rouge. Local 600's beef is that the company is depriving workers of their jobs by moving six-cylinder engine production to Cleveland.

Then and Now in the Olds

Comparison of a modern automobile engine and one of a generation ago has been developed by Oldsmobile Division of General Motors. The monstrously big engine which powered its 1912 Limited measured 5 feet. It had a bore and stroke 5 by 6 inches and a displacement of 707 cubic inches. A six-cylinder with "T" head, it developed 60 hp and was considered a road locomotive. The car it powered listed at $4600 at Lansing, Mich. The V-8 "Rocket" engine has a length slightly less than 3 feet, its displacement is 303 cubic inches. In that space it packs 2¼ times as much horsepower at 135. Cost of the latter-day Olds—a four-door Super 88 being used for comparison — is $2042 at Lansing.

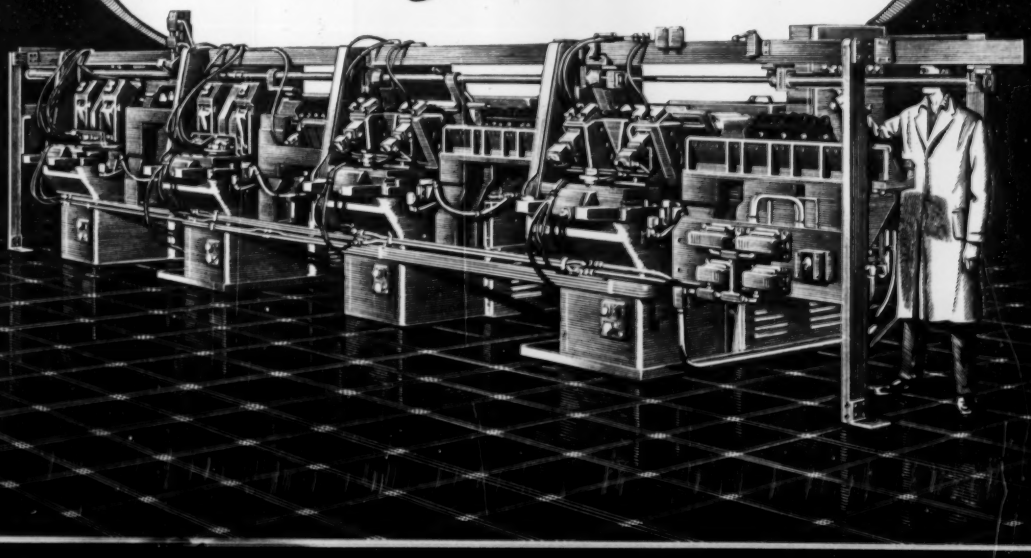
THE NEW BRITAIN MACHINE COMPANY

What names come to your mind when you think of progressive manufacturing?

MOST of the ones you think of first have bought New Britain Automatics within the past few years for new and better ways of doing important metalworking jobs. The New Britain-Gridley Machine Division, The New Britain Machine Company, New Britain, Conn.

AUTOMATIC BAR AND CHUCKING MACHINES • PRECISION BORING MACHINES
LUCAS HORIZONTAL BORING, DRILLING AND MILLING MACHINES

NEW BRITAIN
Automatics



Mechano Set - King Size....

SHARON STEEL USED IN CONSTRUCTION OF FAMOUS BAILEY BRIDGES . . .

Speed is the essence of modern warfare. Whole armies must move fast—even over scorched earth. Retreating units must combat this speed—slow down the pursuer. A most effective method is the destruction of bridges. Rivers are natural barriers to a mechanized fighting force.

The Army Engineers' solution to destroyed bridges is the Bailey Bridge. Resembling a large mechano toy, the bridge comes knocked down in steel sections that can be easily transported and quickly assembled.

Engineers are able to span an impassable ravine in a matter of minutes with a structure that can support loads up to 70 tons. This makes the Bailey Bridge a vital instrument of warfare—one that requires tons of steel. Sharon Steel Corporation is a supplier of steel for these bridges.

***Specialists in STAINLESS, ALLOY, COLD ROLLED and COATED Strip Steels.**

SHARON STEEL CORPORATION

Sharon, Pennsylvania

DISTRICT SALES OFFICES: CHICAGO, ILL., CINCINNATI, O., CLEVELAND, O., DAYTON, O., DETROIT, MICH., INDIANAPOLIS, IND., MILWAUKEE, WIS., NEW YORK, N. Y., PHILADELPHIA, PENNA., ROCHESTER, N. Y., LOS ANGELES, CALIF., SAN FRANCISCO, CALIF., MONTREAL, QUE., TORONTO, ONT.

For information on Titanium Developments contact Mallory-Sharon Titanium Corp., Indianapolis 6

SHARONSTEEL

The Business Trend

End of summer lag in activity may be near as production index stays at high mark. Boost in auto assemblies takes up slack from lowered steelworks operations

TURNING of the production tide from its summer ebb may be at hand. This comforting theory is supported by STEEL's industrial activity index which has risen from the July depths in the past two weeks and is nearing its normal 1951 level.

The week ended Aug. 25 saw the index, at 213 per cent of the 1936-1939 average, come close to repeating the previous week's mark of 211—which was the first sign of increased production activity since July. The latest measurement of the index is significant because lowered steelworks operations dropped several points from the total and the slack was taken up by a rise in automobile assemblies. Freight car loadings were about the same as the week before, and electric power output continued at a record-smashing level.

For the first time in eight weeks, the index also chalked up a higher mark than that of a year before: In the comparative week of 1950, it added up to 207. From this date on last year, the index started climbing and for the rest of the year averaged about 217. The trend in 1951 could well follow that pattern as the vacation season is ending and heavy fall production schedules are being put into the hopper.

Steel Mills Strike Snag . . .

With demand for basic metals so much higher than present capacity to supply, producers have viewed with alarm recent strike developments affecting their industry. Steel companies had come through most of the summer months unscathed by labor troubles and with less-than-normal shutdowns of facilities for repairs. In fact, steel mills have operated at over-capacity rates since mid-March. This string was snapped in the week ended Aug. 25, as a rail switchmen's strike in Buffalo forced a curtailment of operations in that district and cut the national operating rate, as estimated by STEEL, to 98 per cent of practical capacity. American Iron & Steel Institute reports that schedules for the week ended Sept. 1 called for a turnout of 1,995,000 net tons of ingots and steel for castings. A year ago 1,872,000 tons were poured.

Autos On the Upgrade . . .

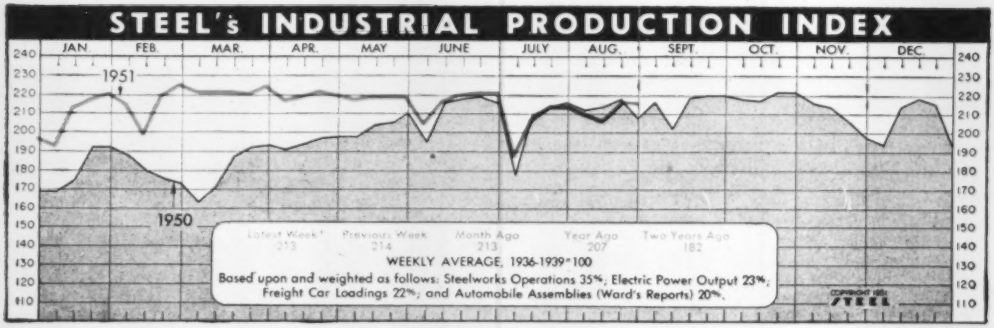
Steel is a big question mark in the auto industry, but there must have been sufficient amounts on hand in the week ended Aug. 25, when U. S. and Canadian plants assembled their highest number of vehicles since the last week of June. Passenger car and truck assemblies for the latest period numbered 139,115 units, says *Ward's Automotive Reports*. This would be nearly 10,000 units more than the week before, but about 40,000 fewer than were turned out a year ago.

September supplies for carbuilding seem assured, says *Ward's*, and August totals will probably show most members of the industry reaching their scheduled output for the month. That would mean about 430,000 cars and 124,000 trucks; the July totals were 382,351 cars and 113,939 trucks.

Factory sales of new motor vehicles in July dropped to 492,311 units—lowest in 18 months, says Automobile

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	98.0	102.0	101.5	90.0
	Electric Power Distributed (million kilowatt hours)	7,077	7,164	7,005	6,346
	Bituminous Coal Production (daily av.—1000 tons)	1,715	1,696	1,712	1,883
	Petroleum Production (daily av.—1000 bbl)	6,250	6,240	6,205	5,699
	Construction Volume (ENR—Unit $1,000,000)	$188.9	$214.9	$251.9	$198.8
	Automobile and Truck Output (Ward's—number units)	139,115	129,661	131,598	179,042
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	833†	829	820	837
	Business Failures (Dun & Bradstreet, number)	130	158	184	176
	Currency in Circulation (in millions of dollars)‡	$27,932	$27,925	$27,706	$26,963
	Department Store Sales (changes from like wk. a yr. ago)‡	−5%	−8%	−23%	+12%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,214	$14,687	$14,998	$15,404
	Federal Gross Debt (billions)	$256.4	$255.9	$255.3	$257.8
	Bond Volume, NYSE (millions)	$10.1	$12.3	$15.6	$15.6
	Stocks Sales, NYSE (thousands of shares)	6,103	7,215	7,864	8,198
	Loans and Investments (billions)†	$70.3	$70.0	$70.1	$68.1
	United States Gov't. Obligations Held (millions)†	$30,949	$30,920	$30,739	$35,078
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.99
	STEEL's Nonferrous Metal Price Index‡	224.6	224.6	226.0	206.8
	All Commodities†	176.8	177.2	178.0	166.6
	Metals and Metal Products†	188.1	188.1	188.2	174.9
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1951
1950
Latest Week* Previous Week Month Ago Year Ago Two Years Ago
213 214 213 207 182
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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*Week ended Aug. 25

Manufacturers Association. August is seeing quite a pick-up in retail sales, however, and the industry thinks it will be hard put to meet demand for new cars this fall.

Wages Rise with Living Costs . . .

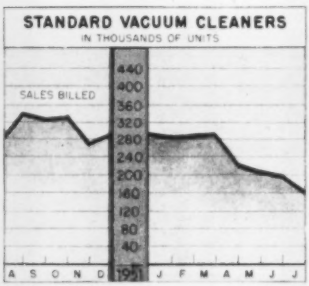
The cost-of-living index, brainchild of the Bureau of Labor Statistics, is becoming increasingly important in a controlled economy. Living costs, as measured by the bureau, were the highest in history on July 15, though they have eased slightly since then. Between June 15 and July 15, the index rose to 185.5 per cent of the 1935-1939 average; the June figure had shown a decline for the first time since 1950.

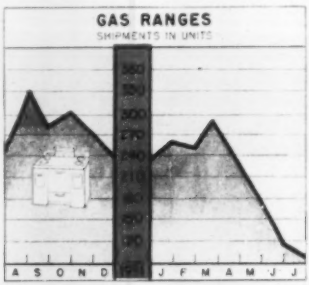
This climb in consumer prices provided an automatic pay boost for about one million auto workers whose wage rates are tied to living costs. More important, the Wage Stabilization Board's new control policy will allow all workers in the nation to get boosts to keep up with the cost-of-living rise since Jan. 15 of this year. To date that increase is about 2.5 per cent.

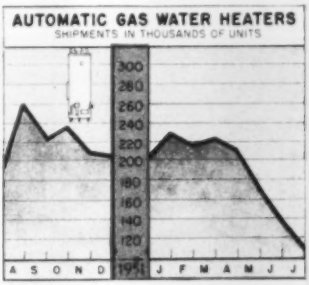
Wholesale prices are currently on the skids: BLS's index dropped to 176.8 per cent of the 1926 average in the week ended Aug. 21, a decline of 0.4 percentage points.

Radio-Television Woes Mount...

Radio and television set production in July dipped to its lowest level in a year, due largely to vacations and plant shutdowns caused by materials cuts and sales resistance. Radio-Television Manufacturers Association reports 116,000 TV sets and 539,500 radios were manufactured during the month, reflecting declines of more than 50 per cent. The industry, noting that military procurement of electronics and communications equipment is at an annual rate of $3.8 billion, is inaugurating a program to assist small manufacturers in procurement of subcontracts.







Standard Vacuum Cleaners

Sales Billed—Units

	1951	1950	1949
Jan.	282,305	249,150	228,769
Feb.	261,572	263,515	241,267
Mar.	290,242	361,014	309,897
Apr.	227,216	292,664	252,656
May	201,983	278,645	222,850
June	194,548	250,190	207,354
July	161,002	279,967	161,920
Aug.	.....	341,232	219,966
Sept.	.....	327,524	250,036
Oct.	.....	331,445	272,520
Nov.	.....	265,310	253,516
Dec.	.....	288,756	265,513
Total	.....	3,529,412	2,886,514

Vacuum Cleaner Mfrs. Assn.

Gas Ranges

Shipments in Units

	1951	1950	1949
Jan.	260,600	165,000	106,700
Feb.	254,000	209,000	117,700
Mar.	289,800	264,000	151,500
Apr.	225,000	239,100	150,100
May	177,800	242,800	151,600
June	113,300	217,000	162,200
July	106,500	254,800	125,800
Aug.	.....	331,500	206,100
Sept.	.....	287,000	227,300
Oct.	.....	308,000	257,500
Nov.	.....	269,100	237,400
Dec.	.....	235,900	175,700
Total	.....	3,023,200	2,069,600

Gas Appliance Mfrs. Assoc.

Automatic Gas Water Heaters

Shipments in Units

	1951	1950	1949
Jan.	225,600	131,600	88,400
Feb.	213,400	156,500	84,500
Mar.	223,300	172,800	106,000
Apr.	199,400	176,400	115,200
May	167,400	195,200	120,200
June	138,600	207,100	132,200
July	110,300	197,500	114,400
Aug.	.....	259,800	138,800
Sept.	.....	222,600	147,300
Oct.	.....	235,100	154,200
Nov.	.....	206,000	138,300
Dec.	.....	202,500	126,300
Total	.....	2,363,100	1,466,000

Gas Appliance Mfrs. Assoc.

Charts—Copyright 1951, STEEL

Machine Tool Shipments Sag . . .

The machine tool industry, vital cog in the nation's armament effort, is still trying to dig itself out from under a huge avalanche of orders. It slipped back a little further in July, however. The industry's unfilled orders continued to mount as new orders exceeded shipments, the National Machine Tool Builders Association reported. Shipments for the month were 145 per cent of the 1945-1947 average, while new orders totaled 490.6 per cent of the base period. Ratio of unfilled orders to shipments entering August rose to 27.8:1, compared to 20.5:1 a month earlier and 17.2:1 in January.

Job Placements Climb Again . . .

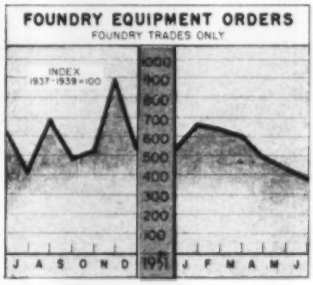
Rising defense manpower requirements and sharp increase in seasonal demand for farm workers caused a record number of public employment service job placements in July. Total placements of 2,097,000 included 585,575 non-farm placements; June's total placements total was 1,869,000. July marked the fifth consecutive month of gain in both placements and referrals of workers to employers. New applications for employment dropped 11 per cent in July because the rush of students and graduates seeking jobs tapered off. While demand for women workers has increased in tight areas, current placement reports do not reflect any extensive hiring of women in jobs traditionally filled by men.

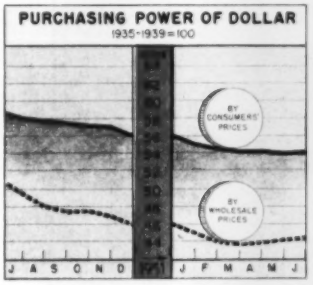
Trends Fore and Aft . . .

July shipments of fabricated structural steel dropped to 202,408 tons in July from June's 257,066 tons, due to restricted mill deliveries. Bookings were up nearly 8 per cent, making a potential volume ahead of 2,687,974 tons . . . Sales of retail stores in July were $11.3 billion, unchanged from June after seasonal adjustment. Durable goods stores sales were down 4 per cent though. Retail sales in August will be well above those of the July lull . . . Volume for the gearing industry decreased by 26 per cent in July as compared with June.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction Aug.27	Gear Sales Aug.6	Radio, TV Aug.20
Durable Goods Aug.6	Gray Iron Castings..Aug.13	Ranges, Elec. Aug.27
Employ., Metalwk. July16	Indus. Production...July23	Refrigerators Aug.6
Employ., Steel Aug.27	Ironers Aug.20	Steel Castings Aug.13
Fab. Struc. Steel...July30	Machine Tools Aug.6	Steel Forgings Aug.20
Freight Cars Aug.20	Malleable Castings..Aug.13	Steel Shipments....Aug.27
Furnaces, Indus. ..Aug.13	Prices Aug.27	Wages, Metalwkg. .Aug.13
Furnaces, W. Air...July30	Pumps, New Orders.July9	Washers Aug.20





Foundry Equipment Orders

	Index		Value in Thousands	
	1951	1950	1951	1950
Jan.	668.0	159.3	$3,075	$731
Feb.	638.6	113.1	2,940	519
Mar.	599.0	225.2	2,758	1,034
Apr.	490.1	160.6	2,256	737
May	431.7	294.9	1,987	1,353
June	393.2	622.7	1,810	2,858
July		401.8	....	1,844
Aug.		693.6	....	3,183
Sept.		483.8	....	2,220
Oct.		526.8	....	2,417
Nov.		885.5	....	4,077
Dec.		526.2	....	2,412

Foundry Equipment Mfrs. Assoc.

Purchasing Power of the Dollar

Cents, as measured by:

	Wholesale Prices		Consumers' Prices	
	1951	1950	1951	1950
Jan.	44.6	53.1	55.1	59.5
Feb.	43.8	52.7	54.4	59.6
Mar.	43.7	52.7	54.2	59.4
Apr.	43.8	52.6	54.2	59.3
May	44.3	51.6	53.9	59.1
June	44.4	51.2	54.0	58.8
July		49.4	....	58.1
Aug.		48.3	....	57.7
Sept.		47.5	....	57.3
Oct.		47.5	....	56.9
Nov.		46.8	....	56.7
Dec.		45.8	....	55.9

U. S. Office of Business Economics

MAINTAIN PEAK OUTPUT with Pheoll precision-made screws, bolts and nuts—they will speed your assembly work and improve product appearance.

INSURE PRODUCT PERFORMANCE with Pheoll quality screws, bolts and nuts—standardize on these dependable industrial fasteners.

HUGE MANUFACTURING FACILITIES assure rapid production of both standard and special fasteners.

SINGLE SOURCE OF SUPPLY for screws, bolts and nuts in different sizes, types and metals.

OVERNIGHT DELIVERY to principal cities from centrally-located Pheoll factory and warehouses.

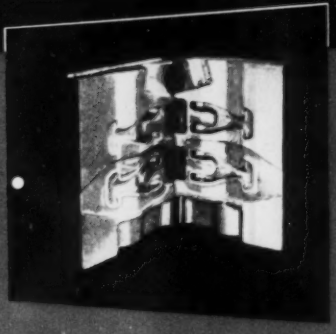
FACTS ABOUT Pheoll YOU SHOULD KNOW

- One of the nation's leading producers of industrial fasteners.
- Pheoll products are widely used in part assembly when quality is of prime importance.
- Men who produce Pheoll industrial fasteners are highly trained and experienced craftsmen.
- All products are manufactured under rigid quality control standards.
- Constant product inspection from laboratory metal analysis, through production and final finish is your assurance of precision made, trouble-free screws, bolts and nuts.

Write for this free Bulletin

Impressions last longer in Hardtem Die Blocks

Photo — Courtesy of The Cleveland Hardware & Forging Co.



Heppenstall Hardtem Die Blocks retain accurate impressions—give more forgings per sinking . . . more forgings per block. Heppenstall special-analysis steels plus unexcelled forging and heat treating skills are sound reasons why!

Job-proved in shops throughout the world, Hardtem Die Blocks actually cost less to use. Top quality is guaranteed by supersonic tests *before* shipping. You can be sure that expensive die layout, sinking and machining operations will pay off in more uniform forgings and increased production —when you standardize on Hardtem Die Blocks. Heppenstall Company, Pgh. 1, Pa.

Heppenstall

. . . the most dependable name in die blocks

PITTSBURGH · BRIDGEPORT · DETROIT

Men of Industry

WILLIAM B. PIERCE
. . . Allegheny Ludlum V. P.

SAMUEL SOSS
. . . new president, Soss Mfg.

FRED BOHLE
. . . heads new department of Illinois Tool

William B. Pierce was elected a vice president of **Allegheny Ludlum Steel Corp.**, Pittsburgh. He joined the company in 1945 as manager of sales development and engineering service department and was named technical director in 1950 when he assumed responsibility for research and metallurgical activities. He retains the latter position as a vice president, and headquarters will be established in the company's new research laboratory soon to be opened at Brackenridge, Pa.

Jens Duus was appointed factory manager, **Buffalo Meter Co.**, Buffalo, succeeding **Walter Boals**, resigned. Mr. Duus formerly was superintendent of Pittsburgh-Equitable Division of Rockwell Mfg. Co. in Brooklyn, N. Y.

Gary Screw & Bolt Division, Pittsburgh Screw & Bolt Corp., Chicago, appointed **William N. Hoelzel** manager of railroad sales, and **John C. Jewett** assistant manager of sales. Both men have been with the company for many years in sales capacities.

E. D. Powers, vice president in charge of production, was elected to the board of directors of **American Cyanamid Co.**, New York, to succeed **H. P. Eastman**, retired. **A. J. Campbell**, general manager, industrial chemicals division, and **Howard Huston**, formerly assistant to the president, were elected vice presidents. **L. C. Duncan** becomes assistant to the president. **J. J. Murray** and **G. C. Walker** were appointed assistant treasurers, and **J. W. King** and **W. B. Ward**, assistant comptrollers.

Samuel Soss, vice president in charge of sales, and secretary of **Soss Mfg. Co.**, Detroit, was elected president to succeed **Charles J. Soss**, elected to the newly created post of chairman of the board of directors. **Stanley M. Disher** was appointed secretary and controller.

George T. Jones was appointed metallurgical engineer, railroad materials and forgings, **United States Steel Co.**, Pittsburgh. **Carl W. Tuttle** becomes assistant metallurgical engineer, railroad materials and forgings in Pittsburgh, and **James R. Hamilton** replaces Mr. Tuttle as senior service metallurgist, railroad materials and forgings, in the Chicago office.

R. G. Scoggins, formerly district sales manager at **Jones & Laughlin Steel Corp.'s** Los Angeles office, was transferred to the tin mill products sales department at Pittsburgh as assistant manager of sales. **R. G. Shearer**, formerly office manager, general sales, was appointed district sales manager at Los Angeles.

Charles B. Pharo Jr. was appointed an assistant manager, bar sales division, **Republic Steel Corp.**, Cleveland. **Henry P. Rankin Jr.**, who has been on leave from Republic to serve with NPA in Washington, has returned and resumes his duties as an assistant manager, bar sales division.

Horizons Titanium Corp., Princeton, N. J., announces that **Dr. Irvin R. Kramer** will join the corporation as assistant to the president. Dr. Kramer's office will be established in Washington.

Fred Bohle was appointed manager of the recently organized machine tool development department of **Illinois Tool Works**, Chicago, with authority over all phases of development, design, production and sales of machines. Formerly chief engineer of the tool division, Mr. Bohle has been with the company since 1935.

L. W. Hanson was appointed vice president of **Armco Drainage & Metal Products Inc.**, Middletown, O., and manager of the Calco division of the company. He replaces **C. R. Hodgkin**, who has been in ill health for a year, but who continues as consultant.

Joseph O'Brien was elected vice president in charge of sales, and **Donald Gay**, general sales manager, **Bristol Brass Corp.**, Bristol, Conn.

O. P. Gokay was elected treasurer of **Cleveland Graphite Bronze Co.**, Cleveland. He continues in the post of comptroller.

Donald C. Minard was elected president of **Trane Co.**, La Crosse, Wis., manufacturer of air conditioning, heating and ventilating equipment. **Reuben N. Trane**, founder and president, was advanced to the newly created post of chairman of the board.

Harry Oldham was named consultant for the foundries of **Hunt-Spiller Mfg. Corp.**, Boston. He is succeeded as superintendent of foundries by **William E. Mulcahy**.

Thorn Kuhl was promoted to public relations co-ordinator of **Packard Motor Car Co.**, Detroit. He succeeds **S. J. Keith**, resigned. Mr. Kuhl will

also supervise publications work in the public relations department.

William L. Fader was appointed general superintendent at the Christy

WILLIAM L. FADER
. . . gen. supt. Christy Park Works

Park, Pa., Works of U. S. Steel Co.'s **National Tube Co.** He joined National Tube in 1950 as superintendent of the shell forge department at the Christy Park plant. He has been assistant general superintendent there since last December.

Walter F. Schneid was elected a director of **Eastern Stainless Steel Corp.**, Baltimore. He has been vice president in charge of operations since 1946.

Roy E. Lambert was appointed assistant superintendent of the Dodge plant in Indianapolis of **Link-Belt Co.** He has been district sales engineer for ball and roller bearings at Chicago.

Charles A. Campbell, Cleveland sales representative, **Dobeckmun Co.,** was transferred to the Los Angeles branch, and **Fraser E. Wilson** moves into the Cleveland vacancy from his present assignment as produce packaging specialist.

Charles B. Sanborn, formerly of the American Steel & Wire Co. research laboratories, Cleveland, has joined the staff of **Graham, Crowley & Associates Inc.,** and will be located in its Chicago laboratories.

Thomas G. Schnorr was named to represent **Die Supply Co.** in its Pittsburgh sales district. He has offices at 122 S. Sheridan.

Promotions in the purchasing department of **P. R. Mallory & Co. Inc.,** Indianapolis, include: **George C. Mercer,** purchasing agent, now director of purchasing, and **W. J. Topmiller Jr.,** assistant purchasing agent, now purchasing agent.

Walter Most was appointed assistant to the production superintendent of Division II of **Oliver Iron & Steel Corp.,** Pittsburgh. **Mike Wesner** and **James McCrossin** were named turn foremen of the cold bolt department.

Rollin P. Smith was appointed project manager of the new plant now under construction by **Titanium Metals Corp. of America** at Henderson, Nev. Mr. Smith was assigned to the new position from Titanium's operation in South Amboy, N. J.

George E. Breen was appointed director of commercial research at **Stanley Works,** New Britain, Conn.

Dr. Mark E. Putnam was elected to the newly created position of execu-

DR. MARK E. PUTNAM
. . . Dow Chemical exec. V. P.

tive vice president of **Dow Chemical Co.,** Midland, Mich. With Dow since 1915, Dr. Putnam has been a director since 1941 and a vice president since 1942.

Reliance Steel Division, Detroit Steel Corp., named **Cyril Bartholomay** district representative for western New York with offices in Rochester. For the last 22 years he has been with Yawman & Erbe Mfg. Co., since 1945 as purchasing agent.

Otto Novy was promoted to assistant director of research, development division, **Chicago Vitreous Enamel Product Co.,** Cicero, Ill.

Richard L. Porter was appointed personnel director of **American Car & Foundry Co.,** New York, succeeding **A. G. Whyte Jr.,** resigned.

G. F. Vietor Jr. was appointed a district manager of **Air Reduction Magnolia Co.,** a division of Air Reduction Co. Inc. He will have headquarters in Houston.

Sub-offices of the recently established Chicago district office of **Hagan Corp.,** Pittsburgh, have been opened and are directed by **Art Soderberg** at Rockford, Ill., **Wilf Chapman** at Peoria, Ill., and **Otto Lessa** at Indianapolis.

Electric Products Co., Cleveland, announces that **Harold J. Thompson** has joined its Chicago agency. Associated with Hooper-Green Co., Mr. Thompson is specializing in handling Electric's line of synchronous and induction motors, a-c and d-c motors and generators, electrolytic power supplies and frequency changers.

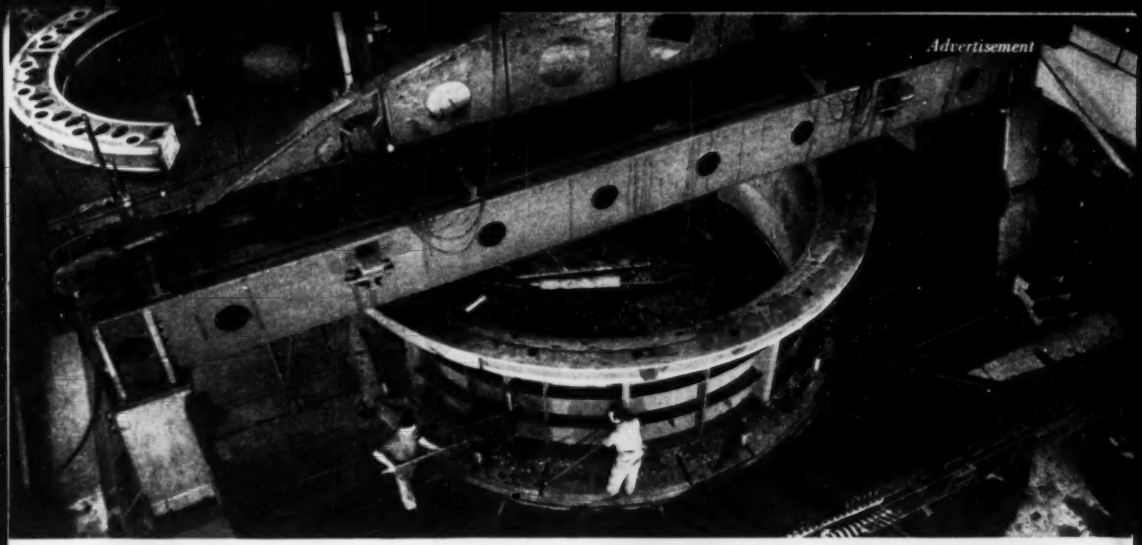
Portable Electric Tools Inc., Chicago, appointed **E. P. Wilmsen** controller, **W. C. MacLean** secretary, and **W. C. Hay** manager of service and traffic.

Aviation-Industrial Chemicals Division of **Fine Organics Inc.** appointed the following sales representatives: **Paul R. Braniff,** Tulsa, Okla.; **James B. Schooler,** Kansas City, Mo.; **Aviation International Corp.,** R. M. Meyer, president, Miami, Fla.; **A. J. Bernard,** Miami Beach, Fla.; **George Hesington,** Lindenwold, N. J.; **Industrial Cleaning Devices Inc.,** Gale Forssen, president, Springfield, Mass.; and **Albon T. Wilson,** Clifton, N. J.

Joseph G. Smith was appointed director of purchases, **Pittsburgh Steel Co.,** Pittsburgh. He succeeds **J. H. Phillips,** who retired Sept. 1 as gen-

JOSEPH G. SMITH
. . . directs purchases at Pittsburgh Steel

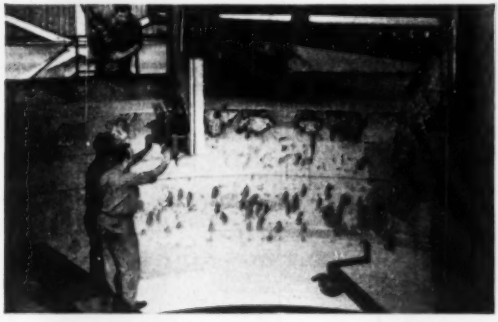
eral purchasing agent. Mr. Smith joined Pittsburgh Steel in 1937 and since has served in various capacities in both the sales and purchasing departments. For the last two and one-



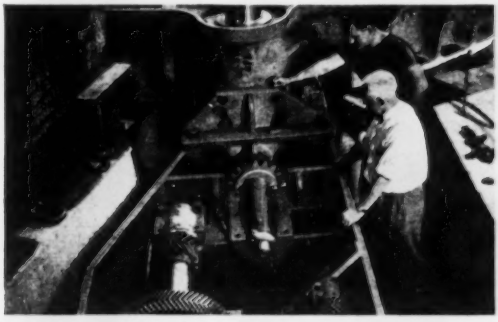
$400,000 VERTICAL BORING MILL, one of the world's largest, bores, turns and faces hydraulic turbine parts. Sunoco Way Lubricant, approved by 39 machine tool builders, was selected by the design engineers to prevent stick-slip with resultant scoring of ways and slides. Even under the weight of work as heavy as 75 tons, Sunoco Way Lubricant has never squeezed out.

TURBINE PARTS 62 FEET IN DIAMETER MACHINED BY HUGE VERTICAL BORING MILL

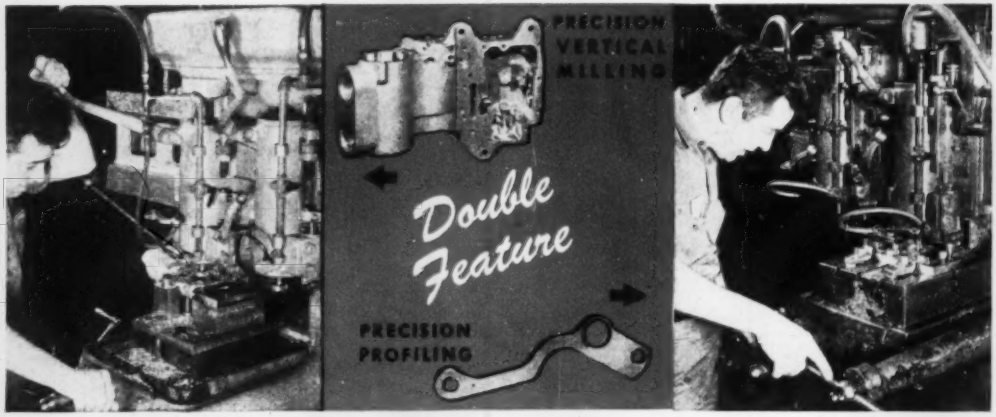
This mill was installed eight months ago by S. Morgan Smith, well-known hydraulic turbine manufacturer. Without alterations, it can take work up to 22 feet high with a maximum swing of 42 feet between housings. By removing the housings and adding a head to the face plate, it can be modified to handle parts 62 feet in diameter. Sunoco Way Lubricant, specified for the ways and rails by the design engineers, has been used exclusively. The mill accommodates work that weighs as much as 75 tons. No jump or stick-slip has ever marred a finish or impaired accuracy. The ways and rails remain like new. This is typical of the performance that has won the endorsement of 39 machine tool builders for Sunoco Way Lubricant. For an informative booklet and sample, write on your business letterhead to Sun Oil Company, Department S-9, Phila. 3, Pa.



ELECTRONICALLY CONTROLLED CUTTING TOOLS machine a turbine discharge ring 9' high, 27' 8" dia., 21' 8" bore. Sunoco Way Lubricant keeps rails free of rust and corrosion. Starting up after week-end shutdowns, tables and other parts move freely on the ways and slides without jump or stick-slip.



THE SYNCHRONOUS GEAR DRIVE, controlling table speeds from .094 to 6.045 rpm., is pressure-fed with another Sun "Job Proved" product—Sunep. This extreme pressure lubricant is exceptionally stable, minimizes wear, gives long-time protection to very heavily loaded teeth in many types of gear boxes.

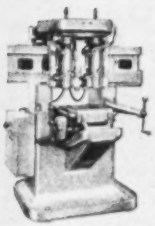


For Toolroom Accuracy on the Production Line

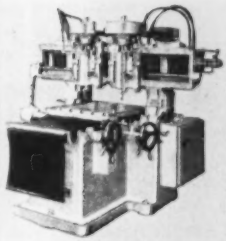
Use Pratt & Whitney Vertical Millers and Profilers

These precision-built machines are specifically designed for the economical production-profiling of irregular-shaped parts requiring accurate interchangeability. Due to their ease of operation and flexibility, they will also outperform other machines on many vertical milling jobs, such as spot milling or facing of small surfaces, hubs, bosses — particularly if they are on different planes or separated by intervening walls.

Rapid, easy operation is assured, not only by the convenient placing of the controls, but also by the free running slides and feed screws, by load compensators, and by the "feel" of the machines which results from effective balancing of the table and spindle head.

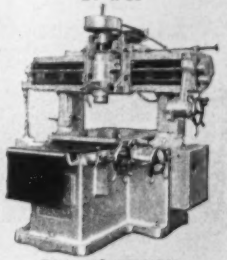


P&W No. 12B VERTICAL MILLER AND PROFILER TABLE WORKING SURFACE 14" x 18"



P&W 30" VERTICAL MILLER AND PROFILER TABLE WORKING SURFACE 24" x 30"

Made in 3 basic sizes, with either single spindle or two spindle heads. Latter provides for dual profiling, or roughing and finishing in the same setup. Oversize tables and various heights between table and cross-rail can be provided to suit the size and shape of the work to be machined.



P&W 40" VERTICAL MILLER AND PROFILER TABLE WORKING SURFACE 36" x 30"

It will pay you to find out what these Machines can do on your work. Get in touch with any of these convenient P&W Branch Offices.

Birmingham • Boston • Chicago • Cincinnati • Cleveland • Dallas (The Stanco Co.) • Detroit • Houston (The Stanco Co.) • Los Angeles • New York • Philadelphia • Pittsburgh • Rochester • St. Louis • San Francisco. Export Dept., West Hartford, Conn.

PRATT & WHITNEY

Division NILES-BEMENT-POND COMPANY

WEST HARTFORD 1, CONNECTICUT, U. S. A.

Dedicated to Accuracy for 91 years

half years he has been purchasing agent.

U. S. Steel Co. appointed **Eugene C. Kennedy** superintendent of its Gary, Ind., works coke plant. He was superintendent, coke plant benzol and by-products department.

Fowler McCormick, who resigned as chairman of the board of **International Harvester Co.,** Chicago, May 28, was appointed a regular member of the executive committee of the board.

Charles E. Peach was appointed chief radar engineer on design and analysis by **Zenith Plastics Co.,** Gardena, Calif. He will specialize in electronics development.

Vic Pastushin Industries Inc., Los Angeles, elected **A. A. Rorison** vice president and secretary-treasurer. He was comptroller. **Charles W. Demarest,** chief tool design engineer, was promoted to superintendent, tool design and tool fabrication. **Joseph H. Moore** was promoted to project superintendent in charge of experimental work. The firm is engaged in manufacture of jettisonable fuel tanks for the U. S. Air Force.

Appointments in production planning at U. S. Steel Co.'s **Fairless Works,** Morrisville, Pa., include: **R. F. Nicholson** as assistant superintendent; **W. A. Hattman,** general supervisor-tin mill planning; **W. E. Wilson,** general supervisor, melting and primary mill planning; and **G. A. Davis,** technical co-ordinator.

BERNARD E. ALDRIDGE
. . . sales mgr. of DoAll's new div.

DONALD GOODWILL
. . . chief engineer, Lees-Bradner

DoAll Co., Des Plaines, Ill., appointed **Bernard E. Aldridge** sales manager of its new cutting tool division, responsible for co-ordinating this new expanded line of products throughout its sales-service stores. **Paul Janesch** was appointed assistant sales manager. **Robert Douglas** was appointed executive buyer for DoAll's expanded line of industrial products.

General Controls Co., Glendale, Calif., appointed **Henry B. Safford Jr.** advertising and sales promotion manager. **Joseph Fallon** was named office manager, Columbus branch.

James K. McGregor, formerly sales manager of **Central Boiler & Mfg. Co.,** Detroit, was named vice president in charge of sales. **Howard E. Stoneback** becomes sales manager and **Paul M. Horal** purchasing agent.

Donald Goodwill was appointed chief engineer, **Lees-Bradner Co.,** Cleveland, manufacturer of gear hobbing and threading machinery. With the company since 1934, Mr. Goodwill has served as assistant chief engineer since 1940.

E. B. Scott was appointed district sales manager for the newly formed Indianapolis office of **Detroit Steel Corp.,** located at 1408 Fletcher Trust Bldg. This previously was part of the Detroit district sales territory.

Lt. Gen. K. B. Wolfe, recently retired deputy chief of Air Staff, Materiel, USAF, was appointed president of the newly organized **Oerlikon Tool & Arms Corp. of America,** Washington, a subsidiary of Oerlikon Machine Tool Works, Buehrle & Co., Zurich, Switzerland.

OBITUARIES...

Joseph E. Rogers, 70, retired president, **Addressograph-Multigraph Corp.,** Cleveland, died Aug. 27. He was active in the company at the time of his death as board member and a member of the executive committee. He retired as president and general manager in 1946.

William H. Wallace, 64, vice president, **Eaton Mfg. Co.,** Detroit, and general manager of its spring division, died Aug. 23 following a heart attack.

Harry E. Kohn, former president of **Precision Grinding Wheel Co.,** Philadelphia, died Aug. 8.

Albert J. Bell, 73, founder of **Bell Bros Co.,** smelter and refiner of nonferrous metals, died Aug. 22 at his Pittsburgh home. Mr. Bell and his brothers formed the company in 1900 and retained an active interest in it for 40 years.

John D. Watson, 71, vice president and manager of **Wisconsin Wire Works,** Appleton, Wis., died Aug. 23.

James Beasley Sr., 95, an authority on rolling metals and associated with **Revere Copper & Brass Inc.,** Rome, N. Y., for many years, died Aug. 21. He initiated many improvements in manufacturing methods at the Rome plant.

Patrick W. McDonough, president of **McDonough Steel Corp.,** Oakland, Calif., died Aug. 25 in Auckland, New Zealand, while on a world holiday tour.

Edward T. Murphy, 71, senior vice president of **Carrier Corp.** and an engineer of almost 50 years experience in air conditioning, died Aug. 21 in San Francisco.

John R. Reilly Jr., 37, sales manager, **South Wind Automotive Heating Co.,** a division of Stewart-Warner Corp., Chicago, died Aug. 19.

Frank V. Carroll, 63, for many years chief engineer at the Indiana Harbor Works of **Inland Steel Co.,** Chicago, and for the last three years consulting engineer for the company, died Aug. 25.

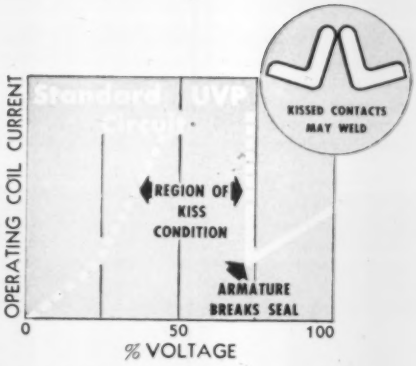
Ariel K. Anderson, 55, vice president of **Martin Hartzog Co.,** Pittsburgh, died Aug. 20. He joined the Hartzog tool manufacturing company and became its vice president in 1920.

Marguerite C. Flockhart, 57, president of **Flockhart Foundry Co.,** Newark, N. J., died Aug. 23.

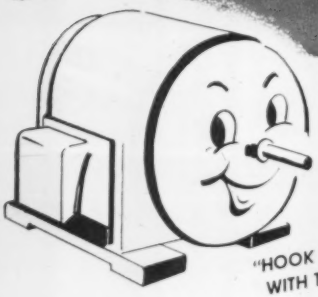
WHEN VOLTAGE DIPS—

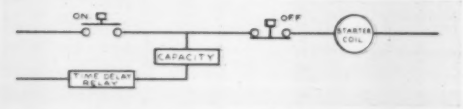
Here's what happens with the Standard Under-Voltage Protection Circuit:

1. Motor Starters open *lazily* when voltage drops (20 to 30% below normal).
2. Contacts may weld due to reduced spring pressure under low-voltage conditions.
3. When there is a complete loss of voltage, pressing buttons to restart essential motor drives is costly and time-consuming.

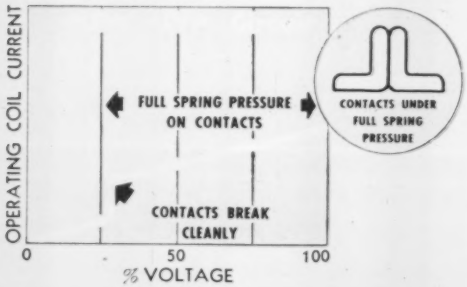


BUT NOW... A.C. Motor Starters are Electrically Locked-in and Will Start Automatically (If Normal Voltage Returns in 2 Seconds or Less)





Simple circuit — no mechanical latches or levers on starter-armature. Only the holding circuit is changed — time-delay of the holding circuit obtained by a simple relay of standard construction having one coil.



NO WELDING OF CONTACTS

This new time-delay UVP circuit uses standard 3-wire Push Button and gives these *advantages:*

1. Starters stay closed under full spring pressure down to a low voltage.
2. When voltage drops to about 75% below normal, contacts break cleanly in opening.
3. Essential drives keep running — by means of an exclusive control method motors *automatically restart* if voltage returns in 2 seconds or less.

Both low and high voltage EC&M Motor Starters are available with this new EC&M UVP Circuit.

WORTH LOOKING INTO—
ask for Accelerator Bulletin No. 30

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Production AND Engineering
NEWS AT A GLANCE

HAIR-SPLITTING ACCURACY— Boon to machinists is a special locating microscope used in precision boring and grinding to find locating points or surfaces. The workpiece is picked up on the microscope (attached directly to the machine spindle) and accurately centered with the aid of cross hairs and concentric circles etched directly on the reticle. In its optical system the microscope incorporates a roof prism which reverts the image to its real position. All table movements are therefore in their true direction cutting down chances for error.

TOWARD BETTER CASTINGS— By photographically "shadowing" molten metal as it flows through channels in a casting mold, Navy researchers are learning how to arrange gating systems to produce smooth metal flow. The investigation showed that contrary to the assumption that metal will flow where open channels exist, metal running in a channel may continue along straight line paths, ignoring side channels and openings. Suitable enlargements at some points in the channels and restrictions in others will cause uniform metal flow into all mold cavities, producing sounder castings.

BETTER HAMMER PRACTICE— Compound curves and sharp radii in heavy gages of corrosion-resistant steels used in aircraft exhaust systems and jet engine components are formed easily by drop hammers. Production at one aircraft plant is double the World War II rate, averaging more than 7 parts per man-hour as compared with the previous 3.8. Many ideas for improved hammer techniques originated with employee suggestions. One idea that is paying off is that of drilling holes in dies and installing drill rods to locate parts in the dies. Called pre-positioning, the method eliminates extra operations of sawing and rough trim, permitting parts to go directly from drop hammer to degreasing. —p. 88

SHORTER SHUTDOWNS— Applications of Thermit welding to repairing steel mill equipment are helping eliminate long and costly shut-down periods. Four standard Thermit mixtures are used: Forging, with 0.15 to 0.25 per cent carbon, 1040, a wear-resistant mixture used to build up conventional three or four-pod roll or pinion wabblers, and cast iron for housings, shears or rolls. —p. 106

NEW ALUMINUM ALLOY— A new light metal casting material—ML aluminum alloy—has been developed by the Air Force for use in elevated temperature operation. The alloy has varying small percentages of copper, nickel, magnesium, manganese, chromium, vanadium and titanium in an aluminum base. Properties permit design of castings, supports and other aircraft parts to operate in temperatures of 500 to 600°C instead of the former 200 to 300° range. At 600° ML will support a load of 6600 psi for 1000 hours, has maximum tensile strength of 17,300 psi.

CERAMIC LININGS— Need for materials to withstand heat involved in rocket motor operation is shoving ceramic lining research into high gear. Showing plenty of promise on severe test-stand firings ceramic-lined motors are in for extensive service testing. A glazed graphite material and a special plaster composition have given excellent results. One advantage of ceramic-lined motors is simplicity of construction. Use of the linings eliminates need for any cooling and thus cuts production time and expense.

MORE ON PHOSPHORUS— Infrared spectra of 60 phosphorus compounds have been obtained and used to formulate a basis for practical application of infrared methods to phosphorus chemistry. It is believed that organic compounds of phosphorus offer many possibilities for use as lubricant additives, pharmaceuticals, plasticizers, fire retardants and other materials.

DOUBLE DRAW— Low alloy high-tensile steels are being double-drawn experimentally on a triple-action hydraulic press used in conjunction with oscillographs which define the most efficient die design and die sequence. Cold reductions as high as 73 per cent of the original blank diameter are obtained without the conventional subcritical annealing treatment.

UNIT CONSTRUCTION— A one-piece forged magnesium stabilizer panel is under development at one of the aircraft companies for use in a jet fighter. It will replace a conventional stabilizer assembly of more than 100 pieces. Also projected for early development is a one-piece magnesium forged bulkhead to replace a unit now being assembled from many individual parts.

CONSERVES PAINT— Use of electrostatic painting is enabling one finishing department to process 2600 units in 6 hours using 9 gallons of paint as against a conventional setup which handled 2100 units in 9 hours, consuming 20 gallons of paint. Changeover from conventional to electronic finishing involves installation of only a power-pack and copper tubing electrodes. —p. 94

MANGANESE RECOVERY— Simplification of a laboratory process for recovering manganese from low-grade ores with waste pickle liquor may result ultimately in commercial operation of the process. In a study of samples of low-grade ore, researchers were successful in developing a procedure by which nearly 90 per cent of the manganese can be recovered with a solution of ferrous sulphate alone.

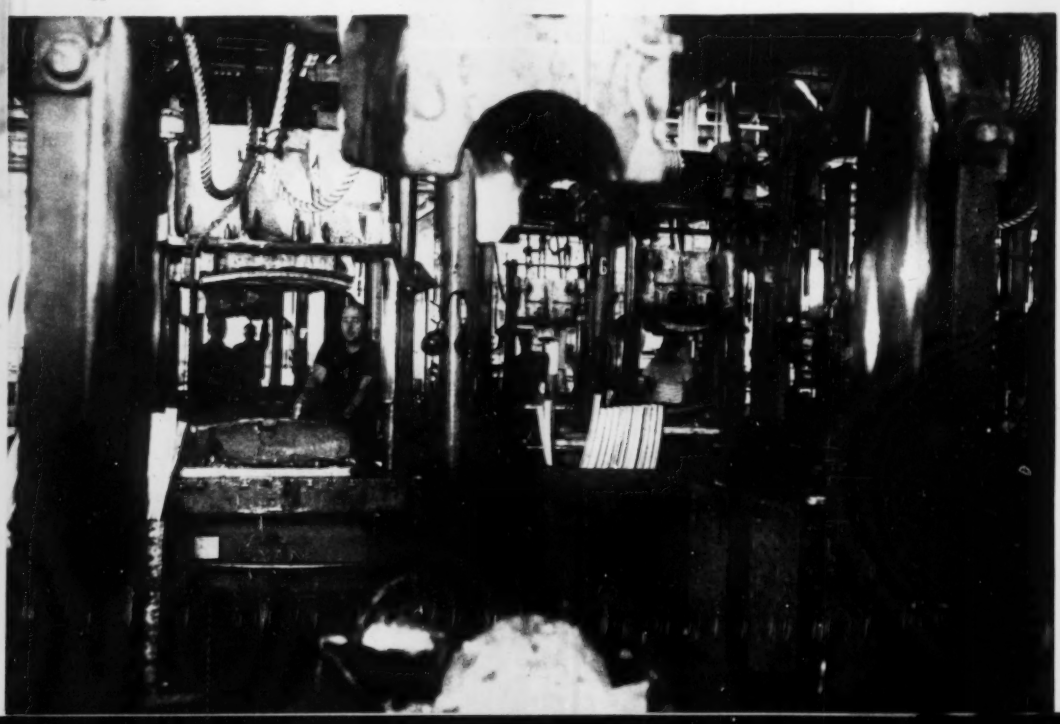
Metalworking Outlook—p. 51 *Market Outlook—p. 151*

HAMMER

Cowls, ducts and fairings of both aluminum and stainless steel also formed by rope drop and air hammers, with production rate that has been doubled by employee suggestions

Left—Fast-moving action of air hammer furnishes power to beat stainless steel sections for manifolds into shape. Some require as many as four separate hammer strikes

This through-the-die shot is aimed at a section of the Ryan rope drop hammer department. Equipment includes 3000-pound hammers with 4-foot square beds



TECHNIQUES ADVANCE

Speed Fabrication of Aircraft Exhaust Systems

PRODUCTION in the drop hammer department of Ryan Aeronautical Co., San Diego, is running at twice the rate attained during World War II. Hammers are averaging more than seven parts per man-hour today as compared with 3.8 during wartime.

Drop hammers are about the only forming method which satisfactorily produces compound curves and sharp radii in the heavy gages of corrosion-resistant steels used for aircraft exhaust systems and jet engine components. It takes heavy impact to shape these structures because of their tendency to spring back when formed. Heavy presses will not do the job, and because each piece of steel is slightly different from the other, keen judgment and experience are required on the part of operators to handle the 3000-pound hammers used.

Hammering Away — Ryan has pioneered in the adaptation of drop hammers to aircraft component manufacturing and over the past 10-15 years has accumulated experience with corrosion-resistant steels and alloys such as Inconel, 19-9DL, stainless types 347, 321, 310, 302, 304, 414, 410, Hastelloy C, 17-14 Cumo, S-816, S-590 and others.

The drop hammer department includes both rope-type hammers and Ceco-stamps. Standard rope-type machines are those with 4-foot square beds and 3000-pound hammers. Parts formed generally run from gage thicknesses of 0.019 to 0.080-inch although on occasions some have been formed of 0.125-inch chrome-moly steel, AISI 4130, with good facility. Drop hammers are well suited for forming all types of engine cowls, ducts, fairings and components with compound curves. At Ryan complete exhaust systems are built for Boeing B-50 bombers, C-97 cargo planes, Douglas DC-6 airliners, Fairchild C-1198 troop carriers, Convair 240 airliners and others.

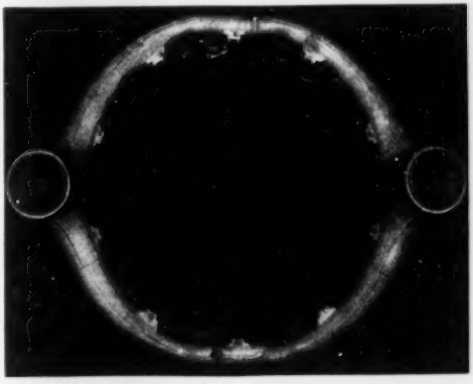
Many ideas for improved hammer practice originated in the form of employee suggestions. One of the first was the idea of adapting a "feeder die" to the forming of the Boeing B-50 exhaust system outer stamping which was then formed in a series of individual dies in stages. It was suggested that a single, long die be constructed which would incorporate the compound curves used in each of the three dies formerly used to stage the forming of the parts. Then the parts would be laid in one end of the die, stamped and pushed through the die in successive movements and stampings, to emerge at the other end as finished parts.

The feeder die proved to be an important time-saving device. Not only were several other dies eliminated from the procedure in connection with the fabrication of the exhaust system but the production rate for this item was speeded. With the feeder die it became possible to form 1250 parts in the same time required formerly for 125 parts. The technique was applied quickly to other components.

Faster Positioning in Dies—Another idea was that of drilling holes in dies and installing drill rods to locate parts in the dies. Called pre-positioning, this method allows the operator to provide accurately for the $\frac{1}{2}$-inch flange desired rather than to guess at the result. Pre-positioning makes it possible to eliminate extra operations of sawing and rough trim, permitting the parts to go directly from drop hammer to degreasing. It is obtained in some cases by cutting grooves in the die faces to hold the parts in definite position.

A streamlined technique which not only has reduced time involved but cut costs materially is a better method for lubricating parts prior to forming. Usual method was brushing with a heavy oil. After forming this heavy oil had to be removed by a rather expensive dichlorethylene degreasing process. This sequence was supplanted by a system of spraying all parts with water-soluble oil, using an ordinary spray gun. The water-soluble oil acted as a lubricant for forming with good efficiency and removing it was a simple matter of immersing parts in a heated alkaline bath.

Operation Sequence Is Involved—It may not be realized generally that there are between 14 and 18 separate operations carried on in drop hammer work on aircraft exhaust systems, and that most parts go

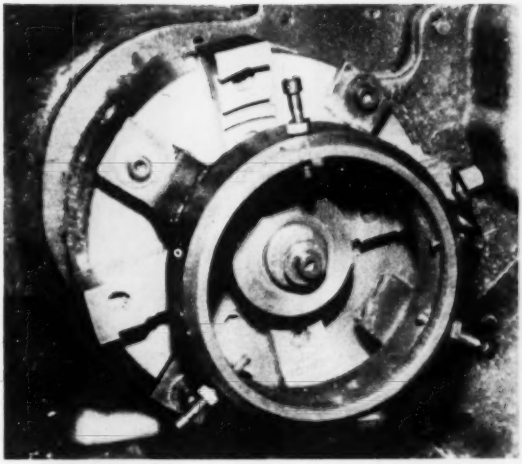


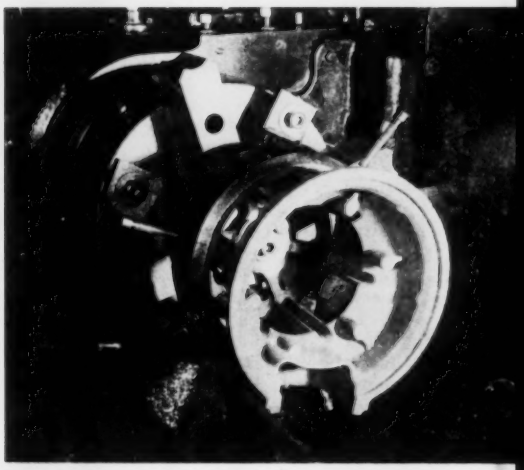
Typical exhaust manifold for radial engine, of heat-resisting stainless steel, with many compound curved sections formed in drop hammers

Diesel Coolers Shipped Overseas

Ships from coolers are to be used in four units designed and fabricated by Young Air Equipment Ltd. to exhaust jacket water and lube oil under tropical temperatures for the GM diesel power plants at Liberia Mining Co. Ltd. Monrovia, Liberia, West Africa.

Each unit's 102 inch propeller can will blow 30,000 cubic feet of air per minute across six rows of extended surface heat exchanger core to cool 300 gallons of water and 150 gallons of lubricating oil per minute.





Pilot in conventional chuck, "cathead" chuck and outboard arm make up special rig designed specifically to reduce distortion, eliminate chatter

Magnesium Alloys Can Be Machined Efficiently

By heeding a few basic design factors and improvising on the job you can minimize complications usually encountered in machining magnesium alloys

By E. A. PARENT
Tool Supervisor
Lima Works
Westinghouse Electric Corp.

MACHINING magnesium-alloy castings is a problem job because of unavailability of special machine tools, increasing design complexity and a general lack of experience with the material. Standard chucks, chucking methods and cutting tools don't do the job; their use generally results in large scrap loss and in excessive production delays. Efficient machining of a magnesium-alloy piece is possible, however, if a few basic design factors are heeded and a little on-the-job improvising is done.

Check Product Design—The first step in expediting a particular job is to re-examine the product design, a task that logically falls to the manufacturing and design engineers. Is the structural design adequate? Cross-sections should be as beefed up—thick ribbing and wall sections help. Are fillets and radii large enough? Fillets should be as husky as possible—should blend with adjoining areas. Can the design be simplified to allow better chucking methods? Once these conditions are satisfied, further improvement depends on the tools and machining methods used.

Conventional chucks having two, three, or four jaws usually will provide the desired adjustability, but when distortion is an important factor, special chuck pads can be made to match the contour of the casting. On a type of chucking designed specially to prevent distortion, by using the bearing insert in the casting plus a pilot in a conventional chuck, the centering problem is eliminated. An outboard arm attached to the "cathead" chuck helps drive the casting—also supports it to reduce chatter.

The "cathead" chuck is fastened to the conventional chuck by screws, keeping the outer surface of the casting in a rigid position during machining while the extreme outer end is supported only by the outboard arm. Extreme caution must be exercised when tightening the locating screws because too much pressure can cause distortion of the part with resultant out-of-tolerance.

Cutting Tools Re-examined—Considerations such as the finish required, amount of material to be removed and product tolerances depend on the proper design of a cutting tool. Although seldom completely satisfactory, the best procedure is to start with rakes and angles as recommended in a handbook for magnesium. From then on, the process is experi-

An employee suggestion led to adoption of this type of "feeder" die which increased production as much as ten times over older setups

Forming punches are cast by pouring molten lead directly into Kirksite (lead-zinc alloy) dies in the shop's foundry

through four distinct forming phases in their fabrication. Steel arrives at the department in shape of rough-cut blanks. It is identified, oiled and formed in the first stage dies of the drop hammer. These dies give the material its first contour and in the case of corrosion-resistant steels this forming immediately begins to work harden the metal.

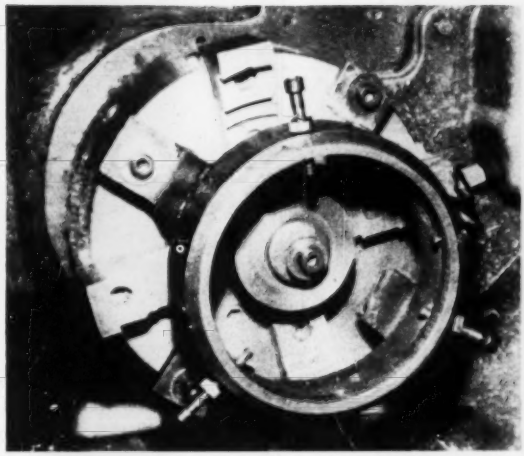
After forming, the material is degreased in the alkaline bath, washed with water, dried and dezinced in a 20 per cent solution of nitric acid. This is required to remove all traces of zinc picked up from the Kirksite dies. If not removed, it will later cause zinc embrittlement when the exhaust system is heated. Next, the material is normalized at 1800° F for approximately 15 minutes to remove stresses from forming. From here, the parts are oiled and formed in a second drop hammer die to attain greater curvature and more nearly fit the desired contour. After removal from the drop hammers, they are trimmed of all superfluous flange area, leaving a $\frac{1}{2}$-inch border. Again, they are degreased and dezinced and heated in the normalizing ovens to remove stresses. From the ovens they are immersed in a pickling solution of caustic salt, to remove oxidation scale and washed with water.

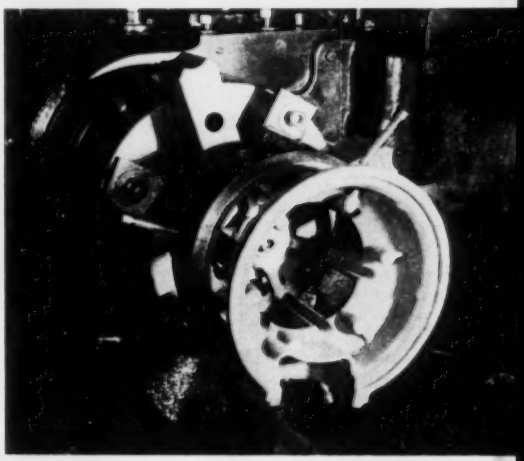
Parts are again oiled and hit with drop hammers in a final form die which has the exact dimensions specified for the engine to which the system will be mated. To provide welders with absolutely square corners and good contact between all surfaces which butt together, parts are "squared" with air-driven planishing hammers which pound out all wrinkles and establish 90-degree angles on all corners. After planishing, the material is again given a final hit in drop hammers to insure exact dimensions because the planishing hammers may disturb these dimensions slightly. Parts are then sawed, degreased and dezinced once more and delivered to the welding department for further fabrication.

Diesel Coolers Shipped Overseas

Huge fluid coolers are the first of four units designed and fabricated by Trane Co., LaCrosse, Wis., to air-cool jacket water and lube oil under tropical temperatures for the GM-Diesel power plants of Liberia Mining Co. Ltd., Monrovia, Liberia, West Africa.

Each unit's 102-inch propeller fan will blow 80,000 cubic feet of air per minute across six rows of extended surface heat exchanger cores to cool 300 gallons of water and 150 gallons of lubricating oil per minute.





Pilot in conventional chuck, "cathead" chuck and outboard arm make up special rig designed specifically to reduce distortion, eliminate chatter

Magnesium Alloys Can Be Machined Efficiently

By heeding a few basic design factors and improvising on the job you can minimize complications usually encountered in machining magnesium alloys

By E. A. PARENT
Tool Supervisor
Lima Works
Westinghouse Electric Corp.

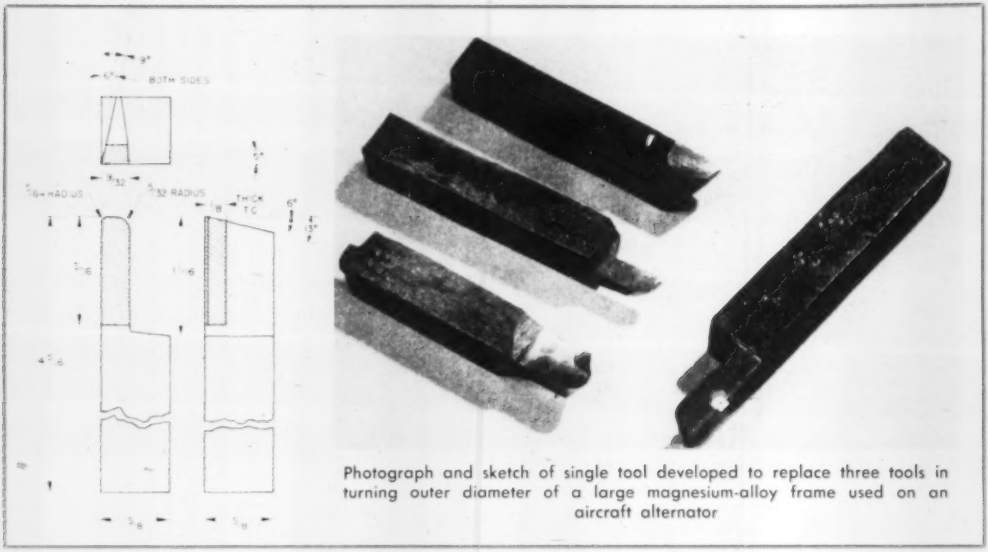
MACHINING magnesium-alloy castings is a problem job because of unavailability of special machine tools, increasing design complexity and a general lack of experience with the material. Standard chucks, chucking methods and cutting tools don't do the job; their use generally results in large scrap loss and in excessive production delays. Efficient machining of a magnesium-alloy piece is possible, however, if a few basic design factors are heeded and a little on-the-job improvising is done.

Check Product Design—The first step in expediting a particular job is to re-examine the product design, a task that logically falls to the manufacturing and design engineers. Is the structural design adequate? Cross-sections should be as beefed up—thick ribbing and wall sections help. Are fillets and radii large enough? Fillets should be as husky as possible—should blend with adjoining areas. Can the design be simplified to allow better chucking methods? Once these conditions are satisfied, further improvement depends on the tools and machining methods used.

Conventional chucks having two, three, or four jaws usually will provide the desired adjustability, but when distortion is an important factor, special chuck pads can be made to match the contour of the casting. On a type of chucking designed specially to prevent distortion, by using the bearing insert in the casting plus a pilot in a conventional chuck, the centering problem is eliminated. An outboard arm attached to the "cathead" chuck helps drive the casting—also supports it to reduce chatter.

The "cathead" chuck is fastened to the conventional chuck by screws, keeping the outer surface of the casting in a rigid position during machining while the extreme outer end is supported only by the outboard arm. Extreme caution must be exercised when tightening the locating screws because too much pressure can cause distortion of the part with resultant out-of-tolerance.

Cutting Tools Re-examined—Considerations such as the finish required, amount of material to be removed and product tolerances depend on the proper design of a cutting tool. Although seldom completely satisfactory, the best procedure is to start with rakes and angles as recommended in a handbook for magnesium. From then on, the process is experi-



Photograph and sketch of single tool developed to replace three tools in turning outer diameter of a large magnesium-alloy frame used on an aircraft alternator

mental, and must be worked out in the shop for each particular job.

A typical project involved the turning of the outer diameter of a large magnesium-alloy frame used on an aircraft alternator. The radii at each end of the frame were not equal, creating a condition which ordinarily would necessitate use of three cutting tools. Restricted tool holding facilities made development of a single tool to do the three jobs a prerequisite of efficiency.

The first tool had a recommended top rake of 10 to 20 degrees, side rake of 10 degrees, and front clearance of 10 to 15 degrees, and a radius on each side. The tool didn't work, but it was a start. By changing one variable at a time, the tool illustrated above was developed. The side rake angle was the only one to come within recommended practices. Most outstanding is the fact that there is no top rake on this tool.

Fire a Hazard—The usual machining rules apply to magnesium: Keep tools sharp for free cutting action; keep tool faces polished to reduce tendency for magnesium particles to adhere to the tool tip; operate at high speed for a good finish. The last rule introduces a hazard unknown in other machining processes—the possibility of fire due to frictional action of the tool and an accumulation of magnesium dust. This hazard is ever present, so powdered graphite should be kept beside the work station at all times.

Appliance Rejects Cut Sharply

Recognizing that high scrap and rework in the manufacturing operation invariably results in complaints and contributes toward unusual service costs in the field, Hotpoint Inc., Chicago, succeeded in reducing rejections from a high of four defects per unit of production for all appliances to less than one, says B. E. Schroeder, vice president of manufacturing. The quality control program was instituted four years ago by the engineering department. Every day engineers take appliances off the assembly line, at random, and inspect them.

When it is economically sound to do so, the appliances or parts are salvaged, after having been brought back to the high standard required by the company. If it is impractical to resurrect them, they are scrapped. Another contributing cause to the decrease in defects has been the institution two years ago of an organization formed to individually tackle the problems of waste and personnel. Representatives from the materials, engineering, and manufacturing departments, as well as plant superintendents and foremen meet to discuss ways of reducing scrap.

Last fall, when new materials were substituted for critical ones, the quality control defects increased slightly until the workmen learned to live with the changing qualities of the new ones. That these substitutions have not resulted in any new complaints in the field since then has been due to the fact that the substituted materials in all cases have been equal to the critical ones in performance.

Summarizing the program Mr. Schroeder says it is based on a continuing effort by management, the engineering, materials and manufacturing departments, as well as the plant superintendents and foremen to lower the number of defects in the appliances—while they are still on the assembly line. The purpose, of course, is to manufacture high quality appliances. This, in turn, results in a reduction in customer complaints and high service costs in the field.

By GUY HUBBARD
Machine Tool Editor

Seen and Heard in

The Machinery Field

KEEPING WITHIN LIMITS: As far as fit and finish are concerned, quality control in machine shops may become unnecessary if and when all machine tools readjust themselves automatically so that nothing but perfect work is produced. While that millennium may never be reached, it constantly is being approached.

That is true particularly in the field of precision grinding, largely for the reason that in grinding machines the worn tools—which are grinding wheels—can be redressed without demounting them and without interrupting the working cycle. For many years machine tool inventors have been taking ingenious advantage of this fact, to develop built-in gaging systems which keep work and wheels in constant dimensional relation—thereby eliminating cut-and-try sizing and a great deal of the sorting out of good and bad work.

Among such systems are those which caliper internal or external cylindrical work, stopping the machine as soon as predetermined size has been reached. Others rough grind, withdraw the wheel, dress its periphery to exact distance from work axis, then finish grind. Still others, on surface grinders in particular, have gage shoes which ride the work and operate through relays to lower the wheel spindle if the work runs too thick and lift it if too thin.

An interesting thing about these systems is that each time they seem on the verge of making quality control obsolete, manufacturing limits are tightened so that what was perfection yesterday falls far below a new 100 per cent mark.

Let's take a look at the record. Where thousandths were good enough during World War I, tenths of thousandths were demanded during World War II. Now we rapidly are getting into an era where millionths show signs of becoming common on production specifications. As a matter of fact they already are common on finishes and are starting to spread to fits. How far this will go, it is impossible to foresee. There are an awful lot of millionths in an inch.

SOMETHING NEW IN HOBBING: One of the most difficult feats in machine tool design is to break away from traditional shapes and arrangements and come up with a new type of machine—new in appearance as well as in performance.

At a preview in the plant of Michigan Tool Co., Detroit, I have just had the pleasure of studying in action what I choose to call "a really new machine tool". It went through its paces capably—not on customary test pieces but on actual production runs of 3½-inch, 9-pitch, 22-tooth, 1-inch face, SAE 5130, helical automotive gears. These were cut, two at a time, in 58 seconds per pair—performance which was repeated over and over on a "you push the button and the machine does the rest" automatic cycle.

This hydraulic feed hobbing machine looks at first glance much like a heavy duty production lathe with gear blanks arbor-mounted between headstock and hydraulic tailstock. A vertical hobbing head is adjustably mounted on a massive quadrant above and behind the bed. Operator can watch the work just as he does in a lathe.

In talking with O. L. Bard, president of the company and with others who were concerned with development of this machine over a period of many months, I learned how they went about it. Through joint conferences between the company executives, tool engineers and designers with production men of prospective user companies, a definite "12-point program" of objectives had been written up before anyone set pencil to drawing paper. Then—disregarding previous practice—the design was worked out to meet that program in the simplest and most direct ways.

For example, they "shot at" hob spindle speeds up to 1000 rpm so that 1300 surface feet per minute with 5-inch hobs will be available if and when carbide hobs become commonly available. To minimize time of automatic cycles, all unnecessary motions were eliminated. To avoid cumulative errors due to piling slides on slides, hob and work spindle bushings are used as ways as well as radial bearings. Also, the lead cam is mounted directly on the rear of the work spindle where its push is direct.

Other significant design trends which I spotted in this machine are: Large diameter, hollow shafts to eliminate wind-up, at the same time reducing dead weight; a generous flywheel on the hob head to iron out torsional vibration; precision shaved involute and straight splines in broached bores instead of ordinary keyway systems; and reduced intricacy of index and main drive systems through use of double enveloping Cone-drives. Their wormwheels are of sandwich design to permit eventual compensation for wear by slight offsetting of the two halves.

One special conviction of mine was confirmed. That is, that no fast, accurate production machine tool ever will be of light, flimsy construction. This hobber occupies only 84 x 84 inches of floor space but it weighs 21,000 pounds—all "solid bone and muscle".

"PSYCHOLOGICAL" CASTINGS: The finest machine tool casting is not a thing of beauty when first shaken out of the sand. Before it is ready to machine, snagging, grinding and dressing down are necessary. These free-hand operations—because of dirt and noise involved—never did mix well with precision work.

In more and more cases, I find that this preparatory work is being done prior to shop delivery—even to the extent of spraying on sealer coats both inside and outside.

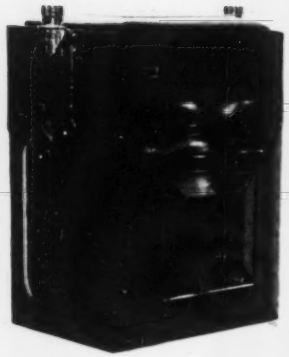
While done primarily to keep undesirable operations away from the shop, this system pays big dividends in the way of reduced breakage and better workmanship. The same technicians who handle rough castings carelessly, treat filled castings with respect, both on machines and on the erecting floor. Psychological effect of a coat of paint is remarkable.

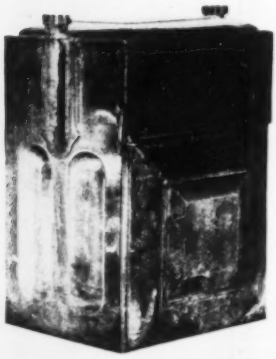
ELECTRONIC PAINTING

. . . A Fast, Economical Finishing Method

Paint savings up to 70 per cent, stepped-up production and intraplant portability are some reasons why you should not overlook this electrostatic process

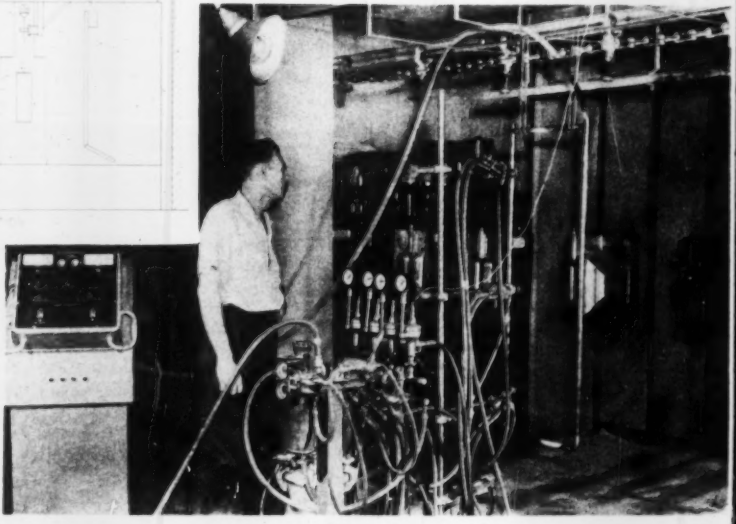
By DAN REEBEL
Associate Editor





These two meter cases both passed by the operating paint guns. Left, electrostatic field was used; at right the field was turned off purposely

Photography by the author



Elevation of a typical installation and view of a pilot setup electronically painting gas meters. Note placement of the three spray guns just behind the hanging copper-tube electrodes

ELECTRONIC painting looks good to many cost-conscious manufacturers—mainly because it uses up to 70 per cent less paint, increases unit production and thus tends to lower operating costs. Conventional spraying wastes about half the paint put through the guns—the electrostatic Paint-Miser, it is claimed, deposits approximately 95 per cent on the work with a negligible paint loss. Also contrary to accepted industry custom, the electronic system is not leased to the user but sold outright by Ashdee Products Inc., Homewood, Ill.

Additional advantages include: Greater coating uniformity; finer surface texture and finish on article being painted; paint is "wrapped" around corners and does not build up "fatty" edges; extreme flexibility in accommodating various types of ware to be finished; portability—it can be moved into existing operations without upsetting production lines and can be transported from one spray painting setup to another with ease.

All that is needed to convert your conventional spraying setup to the electronic method is the addition of electrodes and the Paint-Miser power-pack unit, whose output is variable from 0 to 100,000 v, dc. Input is 110/220 v, 60 cycles, 500 watts. Rectifier is the full-wave type. Current is transmitted from power pack to the electrodes by coaxial cable. Major changes in spray booths, plant layout or conveyors are not necessary as the system can be adapted to practically any existing commercial painting setup.

How It Works—Articles to be painted are moved past the spraying station on an overhead or spindle conveyor running at right angles to the projected spray. As the paint spray leaves the gun, it passes between two negative electrodes and enters a strong electrical field set up by the electrodes. In doing so, it picks up a negative charge and is attracted to the article to be coated, which is at ground potential. This electrical attraction precipitates approximately 95 per cent of the paint spray on the work. It permits operation at low fluid and air pressures which eliminate overspray and cut paint waste to almost nothing.

Some typical case histories reveal that in electronically painting blitz cans used by the Army to carry water and gasoline, production was increased from 750 to 1200 units per hour as compared to conventional spraying techniques. Pieces processed per gallon of paint increased from 110 to over 185. A $16,000 electronic setup for painting locker components paid off in paint savings alone in five and one-half months' operation. Electronic painting of lighting fixture bases showed a 70 per cent savings on 2600 units processed in 6 hours using 9 gallons of paint as against a conventional setup which handled only 2100 units in 9 hours with 20 gallons of paint consumption.

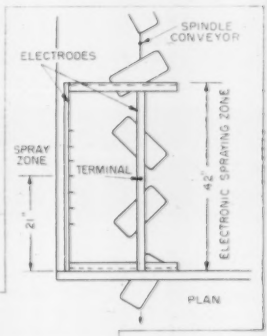
Uses Conventional Spraying Equipment—Spraying equipment of standard makes is usually used at 15 to 18 psi which is in contrast to 60 psi required with a typical hand spray operation. Pressure is just high enough to put paint in motion so it can be atomized by the electrical charge. It is due to the atomization that uniform thickness of painting results. It also gets the paint into recesses and enables it to travel around corners of the piece.

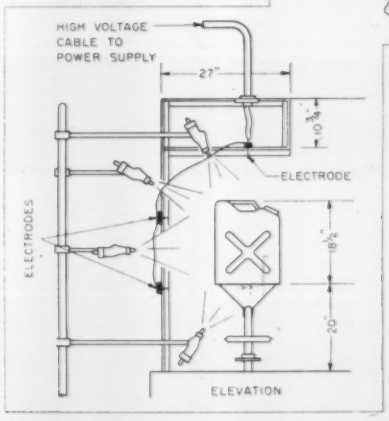
Engineers point out that velocity of paint particles should be relatively low as they approach the object being coated. This makes the electrical field's attraction more effective.

Slow Stuff—High velocity particles may escape the electrical field's influence and become lost. To keep velocity low, atomizing air pressures ranging from 10 to 25 psi are satisfactory.

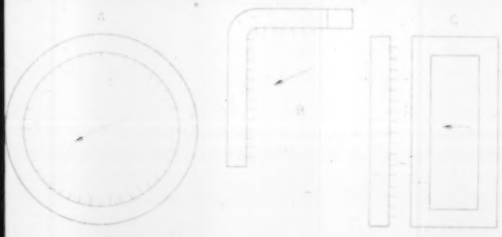
With lower air pressure a reduction in paint viscosity is required to give proper atomization. The

This installation is being used for painting Army blitz cans. Material passes by one four-gun spraying station on a conveyor moving 12 fpm. Guns operate intermittently while the cans rotate at a speed of 24 rpm





Some of the various type electrodes that are used with the process. They are fabricated from copper tubing and have small pin projections pointing toward the piece being painted. On A and B work passes through; on C it moves by parallel



smaller lighter paint particles are more easily influenced by the electrical field and consequently deposited on the work with more facility. Smaller particles also produce a superior finish. Therefore, it is necessary to get the lowest possible atomization pressure consistent with good atomization.

Rotate Symmetrical Objects—Flat panels or long rectangular pieces may be electronically sprayed from both sides in two separate operations. For large surfaces, company engineers point out, a reciprocating mechanism is desirable to reduce the number of spray guns required; it also provides greater uniformity of the paint coating. A long continuous booth may easily be adapted to electronic painting by installation of a turn-around mechanism. Face velocity of the spray booth exhaust system should be reduced to about 100 fpm to aid in controlling overspray. Number of spraying stations is determined by thickness of paint film required. Small nearly symmetrical objects can best be handled by rotating the work on a spindle conveyor. Large nearly symmetrical pieces may be rotated on an overhead conveyor. Number of spray guns required is determined by surface area to be painted and conveyor speed.

Tests are now being conducted on the possibility of perfecting the electrostatic process for handling porcelain enamel finishes. Research scientists explain that enamel fineness is one of the big factors governing the successful utilization of this process for porcelain enameling. Frit size must be brought down to 100-mesh.

Magnetic Fluid Dynamometer

"A magnetic fluid dynamometer is definitely feasible and can be a useful engineering tool," Dwight B. Brede, of the Division of Electrical Engineering, University of California, told the recently held Pacific general meeting of the American Institute of Electrical Engineers.

He said that "The smoothness of control and the possibility of simple water cooling" make the use of a magnetic fluid dynamometer "very attractive, particularly where one is required to run lead tests on larger motors."

His conclusions were the result of an investigation of the use of a magnetic fluid formed by mixing finely divided iron and oil and extensively used for clutch service and for brake service, to a lesser degree.

Other conclusions reached as the result of the investigation were: A mechanical power indicating instrument can be made by using an iron of greater permeability or increased dimensions in the design of the dynamometer, an electric tachometer and a conventional electrodynamometer instrument.

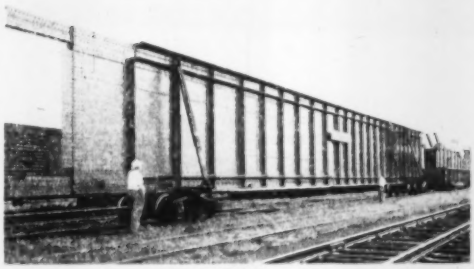
Neoprene O-rings combined with iron guard rings provide a satisfactory seal for the magnetic fluid.

A mixture of seven parts by weight of carbonyl E and one part by weight of silicone oil, 20 centistokes viscosity provides a magnetic fluid of low residual torque and high magnetic fluid torque.

The factor, K' of the magnetic fluid is about 0.02 pound per kiloline.

Further study needs to be made of the factor K' of the magnetic fluid. The tendency of the iron particles to settle out of the mixture may be reduced by adding a thixotropic agent.

Girders Help Haul Themselves



HEADING for the New Jersey turnpike's Passaic river bridge, these girders are shown starting on the first leg of the trip from Bethlehem Steel Co.'s Pottstown, Pa., plant. The three main girders range from 123 to 143 feet long and weigh from 89 to 107.5 tons apiece. They served as the car underframe for the shipment, being placed directly on special car trucks for the trip to the Newark, N.J., area where they will be erected by Bethlehem's field organization

Packaged Electric Power

A new 24-page bulletin on packaged electric power for industry's third—and biggest—expansion is now available from General Electric Co., Schenectady, N. Y. The publication outlines methods of obtaining electric power equipment for quick expansion at low cost and with a minimum of critical materials.

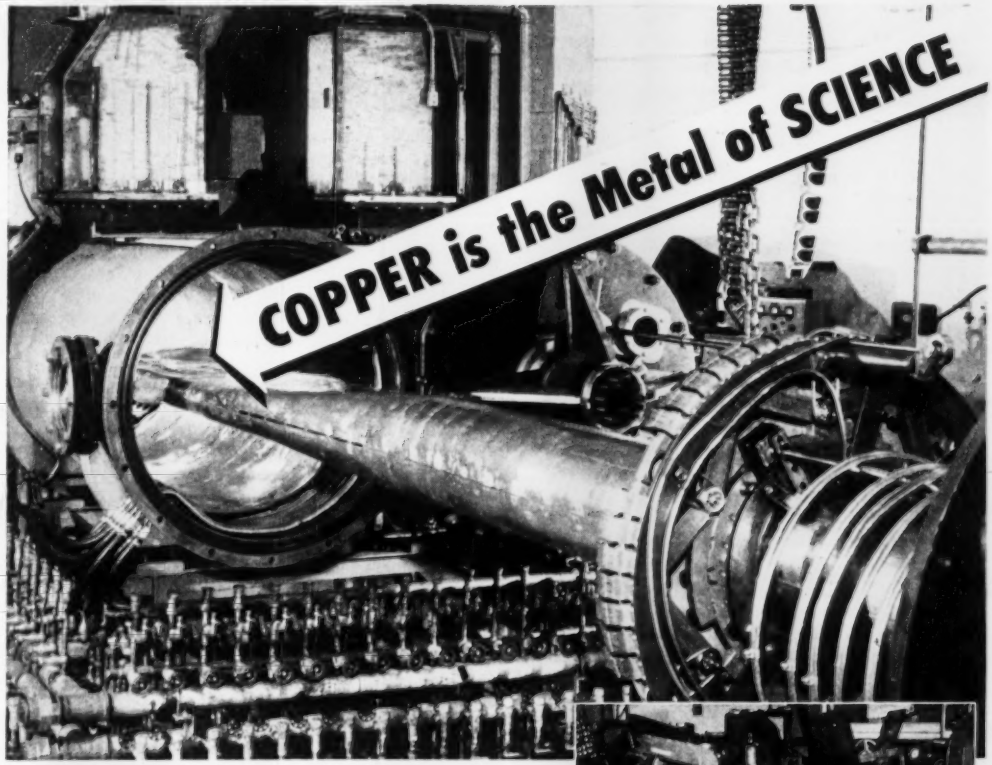
Use of "packaged" electrical systems simplifies plant engineering problems, cuts equipment and installation costs, conserves vital materials and manpower, and insures quicker delivery of electrical equipment, according to the bulletin.

The net result, explained in 52 photographs and diagrams, is a safer, more flexible, more dependable, more economical and more efficient electrical system. The "package" units, comprised of standardized components, eliminate the need for individually-engineered assembly of piecemeal components. Each package is a complete, factory-assembled unit designed for a specific job and ready for operation the moment it is delivered.

Floors Need Engineering Too

A new 12-page illustrated catalog points out why the installation of industrial floors for maximum life and minimum cost is a task requiring experienced planning, skilled technical execution and exacting cost control. It describes how floors can be engineered to withstand moving and deadweight loads, shock and vibration, extremes of temperature, oils, greases, chemical and industrial wastes and other destructive agents. For a free copy write Flash-Stone Co. Inc., Philadelphia 44, Pa.

COPPER is the Metal of SCIENCE



D and D Stem being inserted in Cyclotron; made of Revere Electrolytic high-conductivity copper, hot rolled and annealed, ⅛" thick. Note also large number of bronze valves to control flow of cooling water through brass pipe.

● For many years Revere has been saying that "Copper is the metal of invention." It has high electrical and heat conductivity, excellent resistance to corrosion, is easily fabricated and formed, so that it is attractive to designers and inventors, as well as to manufacturers. Now we say it is also "The metal of science," because it is so essential to the operation of most scientific devices.

The pictures on this page illustrate some of its uses in a cyclotron, built by and for the Nuclear Physics Laboratory of the University of Washington in Seattle. The instrument was designed and constructed so far as possible by University personnel, who were completely successful in working copper into the most complicated shapes.

Revere collaborated on the project in various ways, and furnished copper bar, sheet, rod and tube to the University's high specifications. Remember that Revere will be glad to consult with you on your problems concerning copper and copper alloys, and aluminum alloys.

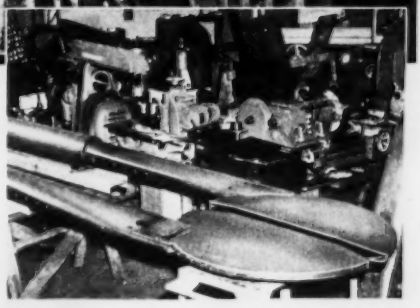


Photo taken in the University of Washington shop during fabrication of the two Ds and D Stems.

Seven miles of Revere copper bus bar were wound into great coils for the cyclotron electromagnet. The University built the winding machine itself, and wound the coils in its own shop. The special Revere bar is soft temper, free from scale, with rounded edges.

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Stamped Motor Housing

Housings for vibrator motors built by Oster Mfg. Co. are now being stamped in two halves from steel, 0.041-inch thick, by Northern Metal Products Co., Chicago. First operation is to blank and draw in a single die after which the flange is trimmed in a second die. In the third operation, the workpiece is sized and the flange drawn back to lengthen the cylindrical portion of the stamping. This results in a square edge in a plane at right angles to the axis and avoids a cross trimming necessary otherwise.

A neck is drawn in the fourth die; in the fifth, the neck is reduced in diameter, a step is formed between the neck and the domed portion and bosses for screws are embossed. In the next die, the end of the neck is pierced from the inside out. The seventh die pierces the two screw holes and the eighth cluster pierces air holes in two operations, one side at a time. This completes the half housing.

Production of the other half follows a similar procedure but a longer and somewhat smaller neck is drawn and the two bosses, which include ten-sided holes for brush holders, are embossed inwardly. Screw holes are pierced in the boss shoulder and four ventilator holes are pierced between the bosses at each side.

Final operation on this half is to thread the inside of the neck, using a special tap which makes cuts only 0.005-inch deep. This thread is not for a screw but for a closely coiled helical spring screwed in to help support and reinforce a flexible shaft sheath. When the motor is assembled, two halves are held together by two screws parallel to the shaft.

Tote Boxes Get Face Lifting

A reconditioning program aimed at increasing the usable lives of its tote boxes is underway at Caterpillar Tractor Co., Peoria, Ill. Complete set of equipment for the reconditioning process is not ready yet but some cleaning, rinsing and painting operations are being carried on. Chipped paint and accumulated rust are removed from the boxes in an airless blast cabinet designed for continual cleaning by American Wheelabrator & Equipment Corp., Mishawaka, Ind. Each box requires 2 minutes of blasting time.

Front of the blast cabinet has two doors, either of which can completely close it. A 66-inch rotating work table is mounted on each door. As a door is closed, the table moves into the blasting zone; when the door is opened, the table comes out for loading. An operator can maintain a continuous cleaning schedule because while one table load is under the blast, he can load the other table and have it ready for blasting when the first one comes out.

A fixture is placed on each table for holding the boxes so all surfaces are completely covered by the abrasive thrown from two rotating wheels. Each box is blasted in two positions with one minute's time required in each position. Caterpillar has approximately 187,000 tote boxes which it intends to put through the reconditioning program. Each box will get the treatment every two-and-a-half years and it is expected that the normal lives of the boxes will be doubled.

Metallizing Uses Grow

Vacuum metallizing, a process for coating the surfaces of metals, plastics, paper, glass, and other materials with an extremely thin adhering metallic film is making possible new products and new applications not readily made by other processes.

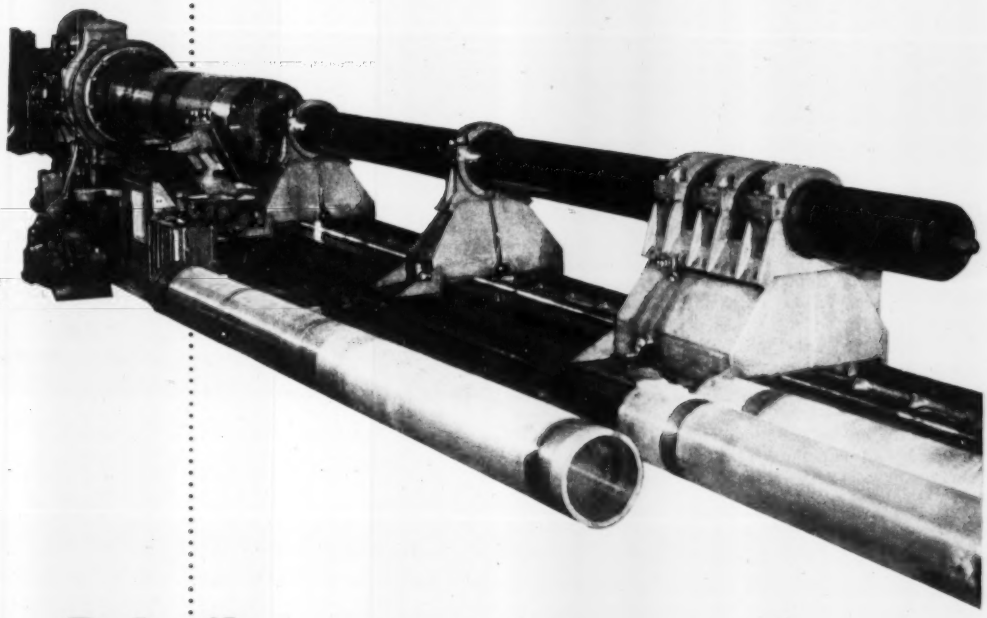
Working principles of vacuum metallizing are simple: Equipment consists of an airtight chamber in which a high vacuum can be created and held; an evaporation source or holder for the coating material; and jigs for holding the objects that are to be coated.

Coating material is placed in source and heated to a temperature at which it evaporates in vacuum, producing vapor particles which travel in a straight line from the source until they strike the material to be coated. Objects can be coated on one side, rotated for coating on all sides, or continuous surfaces may be coated from a roll.

According to engineers of F. J. Stokes Machine Co., Philadelphia, makers of metallizing equipment, almost any type of material can be coated. The only restriction is that it must have a vapor pressure low enough to permit reaching the operating pressure in the chamber. This requirement is met by all metals which can be coated in the form of pieces, filaments, rolls, sheets, etc. The coating materials are pure metals, some alloys and a number of metallic salts. The most frequently used metals are aluminum, gold, silver, chromium, zinc and nickel.

Open-Hearth Tonnage Going Up

BUSY industrial area is the Cuyahoga river valley, where Republic Steel Corp., Cleveland, is constructing new facilities which will increase its annual steel output by 672,000 tons. With the majority of the 4100 foundation piles already in place for the four-furnace open-hearth building, workmen are now laying concrete reinforcing mat. At left is their existing 15-furnace open-hearth building



Rebuilt for new-machine accuracy

Re-engineered for greater capacity

It took some expert machine-tool engineering to convert a 72″ boring lathe into this high-capacity, rapid-production machine. Here's how Simmons *Engineered Rebuilding* went to work for Sandusky Machine & Foundry Company, Sandusky, Ohio:

- **Original 72″ swing increased to 84″ clear over bed.**
- **Capacity increased to take 30″ boring bar.**
- **New carriage has independent motor-operated feed and rapid traverse.**
- **Headstock raised; new castings made for tailstock and bar-rests.**

In addition to adding new capacity, Simmons completely rebuilt the original lathe...dismantled it down to bare castings and thoroughly cleaned it... replaced worn parts...refinished sliding surfaces.

Have you an unusual rebuilding job? Simmons' extensive engineering and manufacturing facilities are especially adapted to the rebuilding of every type of machine tool up to the largest sizes.

Give machine-tool rebuilding a priority in your plans for defense and consumer production. You can start by sending us a list of your machines that require rebuilding. We'll promptly quote prices and deliveries and send you case examples of machine tools rebuilt "The Simmons Way."

SIMMONS MACHINE TOOL CORPORATION
1755 North Broadway, Albany 1, N. Y.

SIMMONS ENGINEERED REBUILDING
Gives Machine Tools a New Lease on Life

Fork Truck-Elevator System Moves In-Process Wire Products

FINISHED and semifinished coils of wire are transported quickly and efficiently considerable distances in the newly-erected two-story plant of Crescent Insulated Wire & Cable Co., Trenton, N. J., by a materials handling system built around fork trucks and a heavy-duty industrial elevator. Pallet and skid loads of in-process wire weighing 2000 to 3000 pounds are moved from station to station—horizontally by Clark fork trucks and vertically by an Otis Pow-R-Truck elevator.

Wire is covered with rubber insulation on the first floor, finished on the second and returned to the first floor to be carried to an older building across the street for shipping or further processing. The fork truck operator places three or more individual pallet or skid loads of wire on the elevator, drives the truck onto the elevator and rides with the skid loads of wire up to the second floor.

From the second-floor landing, the fork truck carries each skid or pallet load of wire to the processing machine. To call the elevator at either landing, the truck operator presses a button on the pendant switch. As the car reaches the floor, the hoistway door and car gate open automatically and the car

levels itself with the landing. The self-leveling feature is important because if the truck rode over a sizable bump between floor landing and elevator platform, the impact might topple the wire coils off the skid.

Appraisal of Oxygen Enriched Blast Encourages Iron Production

By OWEN R. RICE
Metallurgical Engineer
Freyn Engineering Dept., Koppers Co. Inc.
Chicago

THREE large industrial organizations in 1948 pooled sufficient resources, facilities, and capabilities to conduct an extended oxygen-enrichment experiment on a medium-size blast furnace. Equipment was set up to provide 3 or 4 points, percentage-wise, of oxygen increase in the normal blast rate of the furnace, this range of enrichment being deemed sufficient at least to point the way; and such it proved to be.

Through 1949, this furnace was operated for alternating periods on enriched and normal blast. Results were not encouraging in terms of benefits to a furnace on basic iron, or with the kind of raw materials involved. The raw materials were typical of lake ore practice. In general, the teaching was that the effect of oxygen-enriched blast upon the furnace was, in certain respects, impressively similar to that of high-temperature blast. Our lake ore furnaces find it difficult to accept high-temperature blast, and this furnace, which normally found about 925° F blast warm enough, reacted to oxygen-enriched blast in the same manner as it would probably have reacted to 200 or 300° elevation of blast temperature.

The deduction followed that furnace operations, which do regularly accept high-temperature blast, might receive more graciously an oxygen-enriched blast and that high-temperature blast is ordinarily secured far more cheaply than high-oxygen blast. However, there are some furnace operations that are readily accepting blast temperatures of a magnitude which approaches or even reaches the ultimate capabilities of existing forms of hot-blast stoves to generate, or of established equipment to handle safely; at which operations, economies in fuel and raising of production might obtain to still higher blast temperatures. At such an operation, oxygen-enriched blast might show favorably. In this category is a ferromanganese blast furnace, and, throughout the year 1950, it was to a ferro furnace that the research was turned.

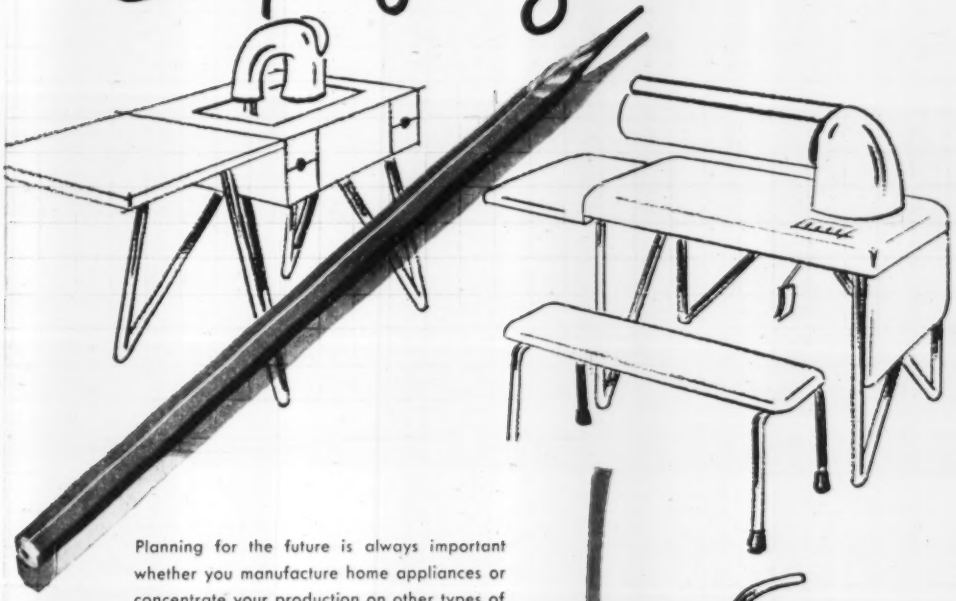
Specific results are not yet ready for publication, but it can be stated that they were encouraging in terms of production, fuel rate, and furnace working. Manganese losses, a highly important factor in ferro operation, did not alter to a disquieting degree. There is as yet no published appraisal of the economic balance of oxygen enrichment at a ferro furnace. Investigations were discontinued as of the first of this year for reasons having no relation to the system.

From a paper presented at the 1951 general meeting of the Iron and Steel Institute, London.

Crobalt Bulletin Announced

Advantages, limitations and fields of application of its cast alloy cutting tools are discussed in a new bulletin announced by Crobalt Inc. Working conditions under which high-speed steels, cemented carbides and cast alloy cutting tools each give best performance are described in the bulletin. It lists seven advantages and gives the properties of three grades of Crobalt that bridge the gap between high-speed steel and carbide tool applications. Copies are available from the company at 2800 S. State St., Ann Arbor, Mich.

Shape of things to come...



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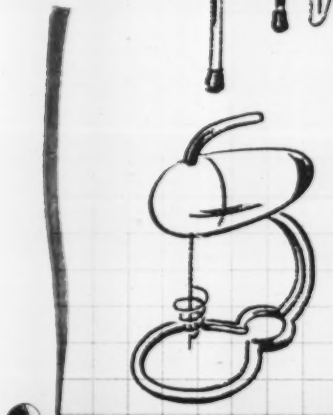

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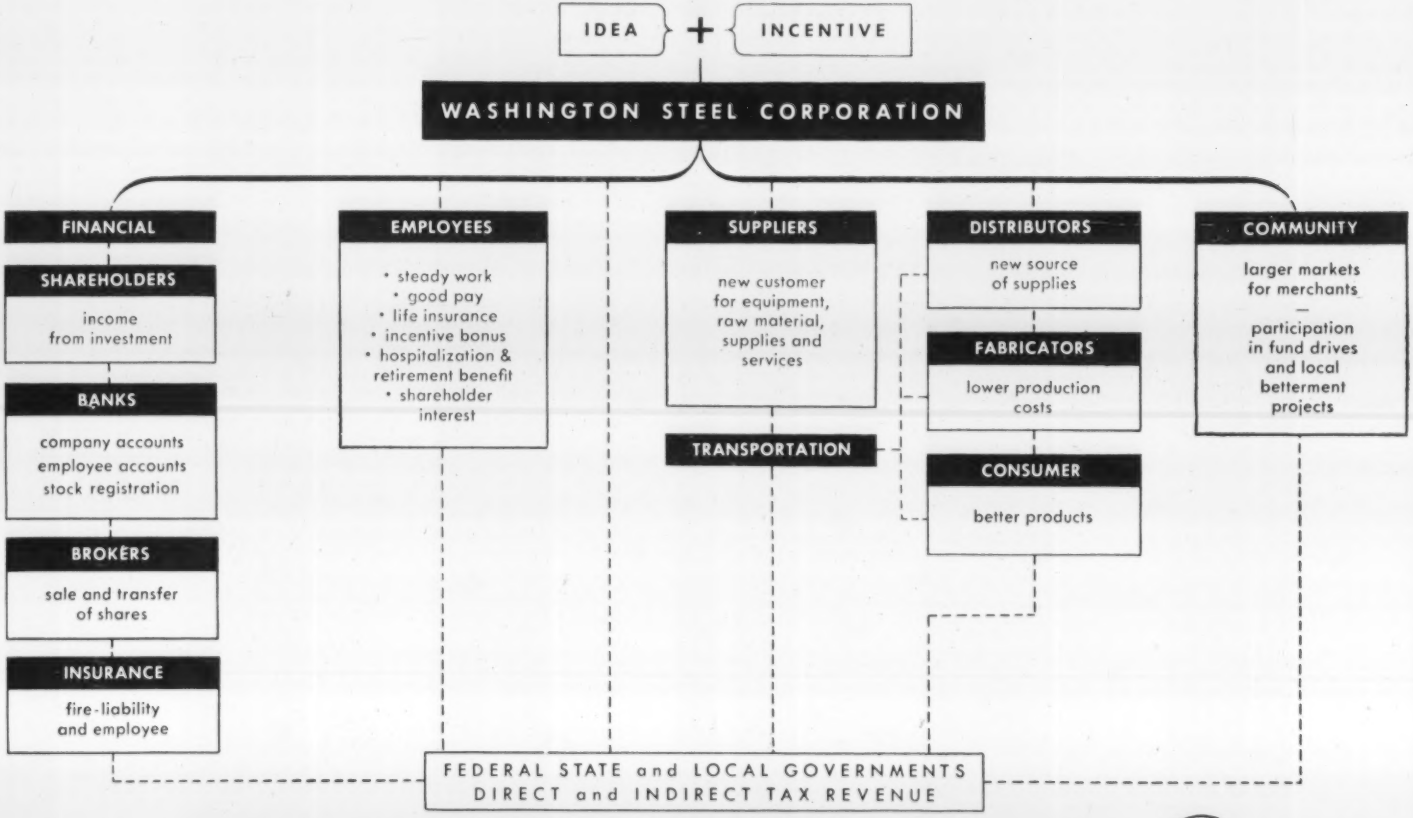
Who gains by the incentive system?



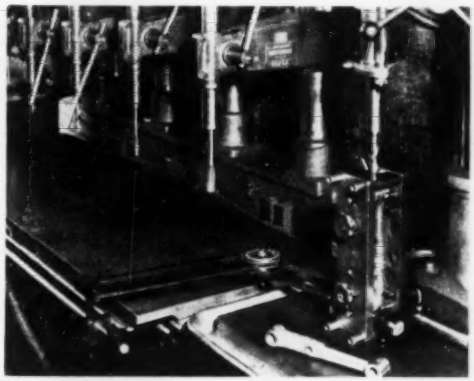
WASHINGTON STEEL CORPORATION, Washington, Penna.
manufacturers of MicroRold stainless steel sheets and strip

STEEL

Work Moves Quickly in Five-Spindle Drill Press Setup

FRONT RAIL mounting system developed by engineers at Torkarm Corp., Minneapolis, enables one of their Torkarm units to be moved quickly from one spindle to another on multiple spindle drilling, reaming and tapping setups.

In the case illustrated, this system is serving a station-to-station sequence requiring five spindles, even though the only multiple spindle drill press available has only four spindles. The fifth spindle is provided



by locating a single spindle machine alongside the four spindle model on which the front rail is mounted. Reach of the arms of the attachment is sufficient to center the jig under the spindle of the auxiliary machine.

Purpose of the Torkarm is to provide quick means for locating work in line with one or more spindles, and at the same time to protect tools and work by allowing "float" to balance tool torque. This combined floating and snubbing shock absorber action is concentric with centerline of spindle and tool, thereby avoiding side pressure and rubbing action of tools on jig bushings and on holes in the work. This does away with undue heating and wear and keeps work from climbing the drills.

Cladding Patent Issued

American Cladmetals Co., Carnegie, Pa., announces that a patent entitled "Procedure for Making Composite Strip Metal" was recently issued to them. It covers an invention that provides for an improved method of producing cladmetals, including their Rosslyn metals.

The procedure basically covered by the patent is one of continuously bonding chrome-nickel steel and copper in the production of Rosslyn metal, although it is also applicable to any metal cladding. At the present time, as a matter of fact, American Cladmetals is using other Kinney processes in the cladding of copper to steel and silver to stainless steel.

The finished product is soft and devoid of "roll set." This holds true even though it is coiled when cold. In addition, the bonding operation is accomplished without materially reducing the thickness of the composite strip.

Grinding Wheel Facilities Added

A program of new production facilities for the manufacture of vitrified and resinoid bonded grinding wheels has been approved by the National Production Authority for Simonds Abrasive Co., Philadlephia. The project includes an additional continuous tunnel kiln installation, with building to house it, for the production of vitrified bonded products and an additional complete production line setup for the manufacture of resinoid bonded wheels. Also included in the project are extensive air conditioning, electrical wiring and materials handling equipment installations. Substantial installation and construction work is currently in process.

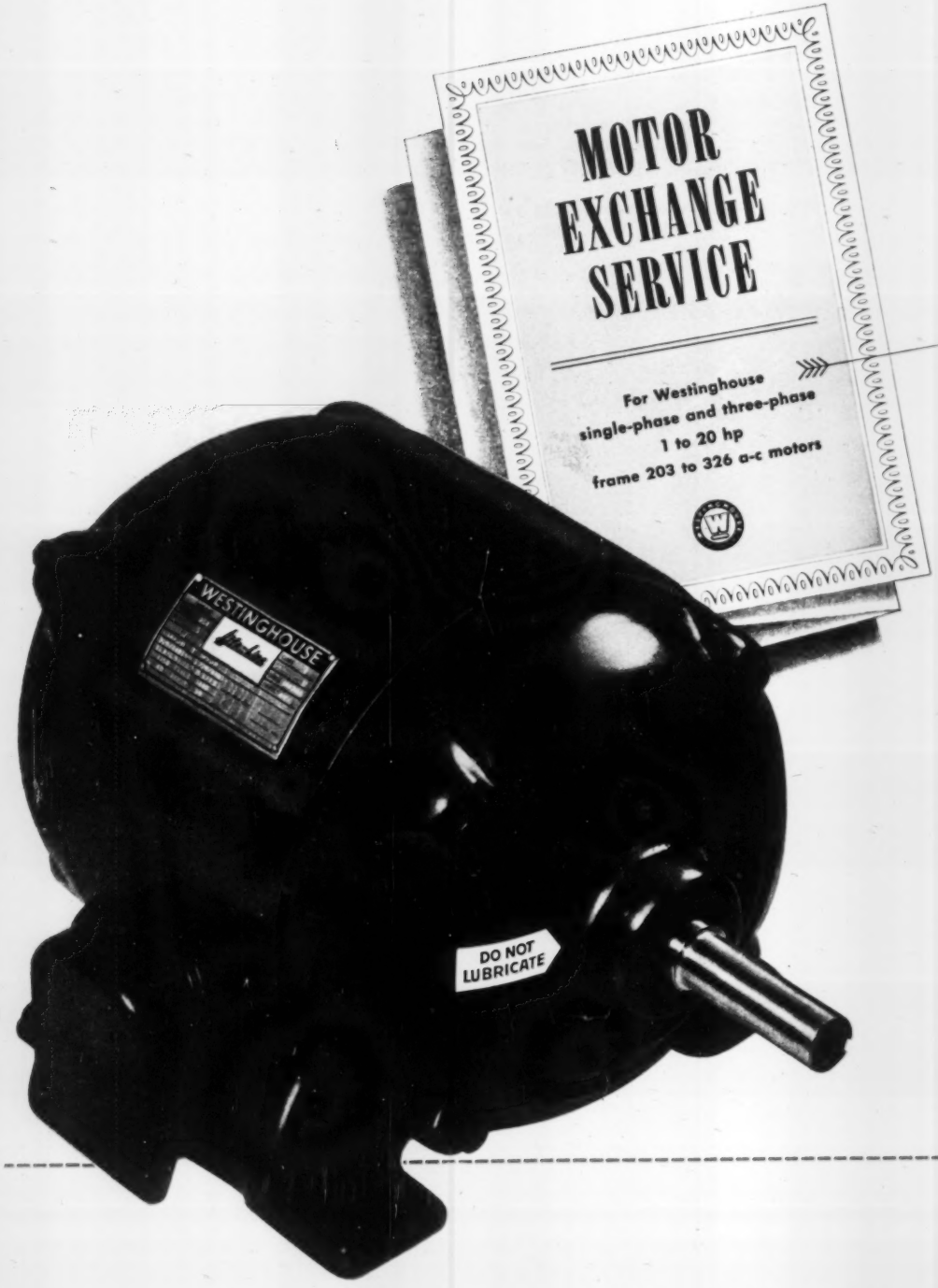
Collapsible Drums Save Space

THIS new 55-gallon synthetic rubber-fabric drum made by United States Rubber Co. for shipping liquids can be collapsed after emptying, is returnable and reusable. The drum should effect sizable savings in return shipping costs, since more than 2500 collapsed drums can be shipped in a standard railroad box car that would hold only 300 rigid drums. An empty drum weighs less than 30 pounds.

Experimental tests indicate that the new containers will be suitable for shipment of oils, greases, fats, acids, paints, emulsions, soaps, dry powders and a variety of pharmaceutical and industrial chemicals. It may also be practical for transporting liquids by air for the military and for parachuting liquids to ground troops.

The result of nearly three years' development work, drums are made of Ustex cord fabric, impregnated

with synthetic rubber and molded in one piece. The material is noncorrosive, nonabsorbent and resistant to weathering. The drum needs no venting while being filled or emptied.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120 Westinghouse exchange points assure you rush motor replacement service anywhere in the United States. Replacement motors, covered by the plan are normally in stock, ready to be speeded to you at any time.

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This service is one more advantage you get with Life-Line motors. Add this to steel frame construction . . . pre-lubricated bearings and you'll see why Life-Line is the best motor production insurance you can get.

Complete details? Ask for a copy of Life-Line Exchange Service (SM-5243). Your Westinghouse representative has one for you, or write Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Penna.

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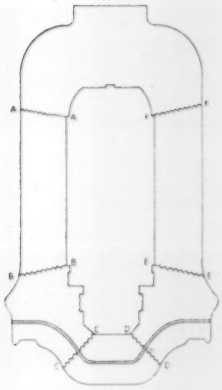
THERMIT WELDING

Widely Used in Steel Industry

While in many cases Thermit welding is considered in the light of a repair, it should be remembered that such repairs are permanent and very often eliminate a weakness in the original casting or forging. Cast iron can also be successfully welded although its field of application is not as great as that of steel; shrinkage control is more uncertain

By JAMES M. WILSON
Division Engineer
Metal & Thermit Corp.
Pittsburgh



Sketch shows typical locations of breaks often found in rolling mill housings

EXTENSION of the steel industry's production efforts with its attendant abnormal service demands on production facilities, demands a review of some Thermit welding applications which may help steel men to eliminate long and costly shut-down periods and keep much-needed production equipment in continuous operation.

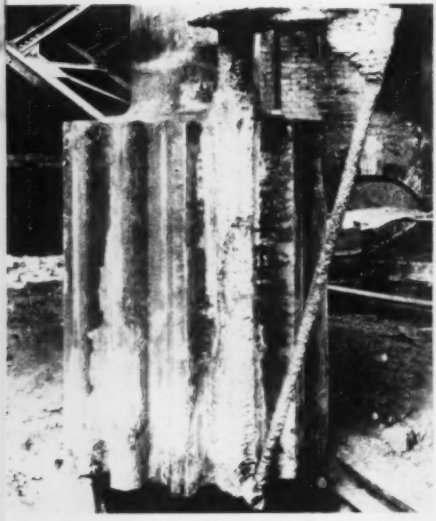
Four standard mixtures are being used in steel mills, namely: Forging Thermit containing 0.15 to 0.25 carbon, 1040 Thermit containing 0.35 to 0.45 carbon, wabbler Thermit, a wear-resistant mixture designed for building up conventional three or four-pod roll or pinion wabblers and cast iron Thermit used in welding cast iron housings, shears or rolls. Some of the more frequent applications for which they are currently employed will be described.

Both steel and cast iron housings can be successfully Thermit welded although cast iron presents additional problems in both shrinkage control and machining after welding.

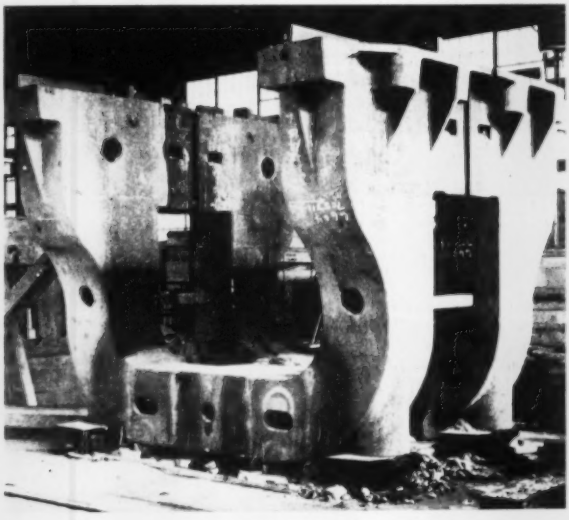
Sketch shows a typical mill housing with several probable locations of failure indicated.

Heat Control Procedure Insures Stress-Free Welds—A definite heat control procedure has been developed for welding cast steel housings that insures stress-free welds and is considered by those mills having their own Thermit welding departments to be safe, practical and permanent. For example, in welding a break at point A, heat is conducted in both di-

A new tooth was cast on this mill pinion by the Thermit process



This 50-ton ingot stripper stand housing was fabricated from two castings



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Send for latest information-packed "BIG-THREE" catalog. It contains such data as mounting instructions, recommended speeds, charts, specific applications, etc.

rections from the weld area and it will be noted that one direction will carry the heat and resultant expansion around the housing's top end. This must be counteracted in some manner to eliminate undue stress in the weld area during cooling. Application of heat between A and F will accomplish this, and, as a counter measure to relieve stress and equalize shrinkage, heat is also applied between B and E. Breaks at B, E and F may be handled in a similar manner.

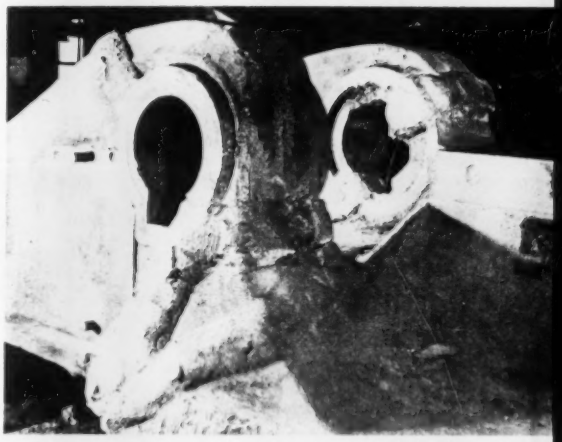
Cast iron housings cannot be held to accurate dimensions by heat but in some cases mechanical means may be employed to produce similar results to that of steel. When heat or mechanical means do not seem to be the answer the operator may resort to another method that has been successfully employed. If a break occurs at A or B, the opposite and unbroken leg may be cut at E or F. This requires two welds which are made simultaneously to procure uniform shrinkage of both legs and obtain a completed stress-free housing when cooled. This method with its two welds is of course from 50 to 75 per cent more expensive than a single weld but where loss of production is a big factor, additional cost of repair may be negligible.

Process Versatile for Pinion Work—Thermit welding of pinion ends has been employed since the days of the uniformly used wabbler-type drive. One pod may be recast entirely from Thermit steel or, in cases where the wabbler end is completely broken off, a new end from a wornout pinion or roll may be furnished and the weld made somewhere in the bearing between the pinion's body and the fluted wabbler. Since the Thermit collar is designed only to furnish sufficient superheated steel to dissolve and unite the two sections, all or any of it can be removed to provide a normal bearing after the weld has cooled.

Another pinion's application is for replacement of broken-out teeth. In this operation, entirely new teeth are cast from Thermit steel. To insure complete fusion to the pinion, a recess is cut into the body one-half the height of the tooth in depth and one-half its width at the root. In most cases the tooth is recast to conform to the wear of the remaining teeth so that no machining is necessary after welding. Because only a small area of the body surface will be in contact with the weld, the entire pinion must be heated to a red heat to arrest heat conduction from the point of weld. This heating has an added advantage in that it automatically normalizes the whole pinion and removes any fatigue stresses that may be present.

Saves Rolls From the Scrap Pile—Replacement of universal drive pods on both male and female ends of rolls or pinions is considered a routine application in most plants having their own Thermit welding departments. It is suggested that an oversized forging or casting be used for replacement to insure accurate machining after welding.

Rolls having part of a pass flange broken out may also be saved from the scrap pile at a fraction of the cost of a new roll. In addition it is practical to redesign a roll pass by applying a Thermit weld around the body at the point where redesign is required.



Completed Thermit weld in an alligator shear frame

In recent years some blast furnaces have adopted Thermit welding as a means of repairing cracked slag pots. Advantage in this application lies in the fact that cast Thermit steel more nearly matches cast steel in the pot itself than is possible by any other means of welding and consequently lends itself more uniformly to the heating and cooling cycles involved.

Welded Rail Joints Offer Advantages—Welding of rail joints offers many advantages in steel works, blast furnaces and coke plants. In coke plants Thermit welding of rail joints is a universally accepted practice when new ovens are built or rails are renewed in the pusher, quencher or larry tracks. Thermit welded rail joints for blast furnace supply car tracks provide long-term, trouble-free operation at the location where the rails are usually embedded in concrete.

Incalculable maintenance costs due to bad crane rail joints are well known to all steel plant maintenance superintendents; Thermit welding the runway rails into continuous lengths offers an effective and economical solution. In many steel mills considerable outside trackage is embedded in concrete along driveways or in road crossings, and, here also costly joint repairs may be completely eliminated by using Thermit welded rail joints.

Shear housings, manipulator racks, engine shafts, charging peels, ingot buggies and similar equipment are but a few of the other items which are being reclaimed almost daily by use of the process.

Roller Chain Catalog Ready

A new catalog of stock roller chains and sprockets has recently been announced by Morse Chain Co. It gives details on list prices, available sizes of their types A, B, and C stock sprockets, and pertinent information on stock roller chain from ¾ to 2-inch pitch. Also included are data on drive selection, service factors, installation, and service. Copies are available from 7601 Central Ave., Detroit 8.

More output per man,

Production Increased 29%

Grade: MX
Size: ¾" Hexagon
Part Name: Master Cylinder Outlet
Machine: 1¼" RA-6 Acme-Gridley
Operations: Forming, drilling, threading, shaving, turning, cut-off

Comparative Production:

Grade	SFM	Spindle Speed rpm	Seconds Per Part	Hourly Output Rate	Actual Hourly Output*
B-1113	213	942	7¾	465	326
MX	275	1215	6	600	420

Results: Increase in production rate, 29%; increase in surface feet and spindle speed, 29.1%; increase in tool feed, 7.38%. Finish greatly improved.

*Based on 70% efficiency.

Cold-finished material furnished by Canadian Drawn Steel Company, Ltd.

Production Increased 33⅓%

Grade: MX
Size: ½" Hexagon
Part Name: Tube Nut
Machine: ½" Davenport Model "B"
Operations: Forming, drilling, threading, reaming, cut-off

Comparative Production:

Grade	Surface Feet for forming	Surface Feet for drilling	Spindle Speed rpm	Feed for Drill	Seconds Per Part	Hourly Output Rate	Actual Hourly Output*
B-1113	257	139	1700	.0067	2.4	1500	1050
MX	292	157	1930	.0085	1.8	2000	1400

Results: Increase in production rate 33⅓%; increase in surface feet and spindle feed, 13.6%; increase in drill feeds 25.4%, increase in drill surface speed 13.6%. Finish greatly improved.

*Based on 70% efficiency.

Cold-finished material furnished by Canadian Drawn Steel Company, Ltd.

Production Increased 50%

Grade: MX
Size: ⅝" Hexagon
Part Name: Hose End Blank
Machine: 1¼" RA-6 Acme-Gridley
Operations: Forming, drilling, reaming

Comparative Production:

Grade	SFM	Spindle Speed rpm	Seconds Per Part	Hourly Output Rate	Actual Hourly Output*
B-1113	221	1166	6	600	420
MX	290	1536	4	900	630

Results: Increase in production rate, 50%; increase in surface feet and spindle speed, 31.8%; increase in tool feed, 15.9%.

*Based on 70% efficiency.

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per machine, per hour . . . when you do the job with MX

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Here again, as in shops in this country where U·S·S Free-Machining MX has been put to work, output per man, per machine, per hour has increased. In addition, costs have dropped and part finish has been improved.

While production increases of 29%, 33 1/3% and 50% like those shown here are important, equally important is the fact that MX, because of its greater uniformity and better machinability, will permit you to turn out quickly and to close tolerances the more intricate and precise products you are being asked to produce.

What's more, MX will cut the cost of *any* part you now machine from ordinary Bessemer screw stock, even though MX costs a little more. We base this claim on the amazing results obtained with MX to date, in producing over a billion parts of many different kinds.

U·S·S Free-Machining MX more than pays for itself by (1) increasing the rate of production which *lowers the cost per part*. By (2) prolonging tool life which *reduces machine down-time*. By (3) assuring better part finish which often *eliminates extra finishing operations*. By (4) providing closer dimensional accuracy which *minimizes rejections*.

You owe it to yourself—and to your customers—to give MX a trial.

U·S·S Free-Machining MX is being produced in all the popular screw stock sections and sizes. You can obtain it in cold-finished form from your regular supplier as "MX," or under his own identifying trade name. In hot-rolled form, MX is available direct through our nearest district sales office.

Now, when production is more important than ever—speed up the job with MX

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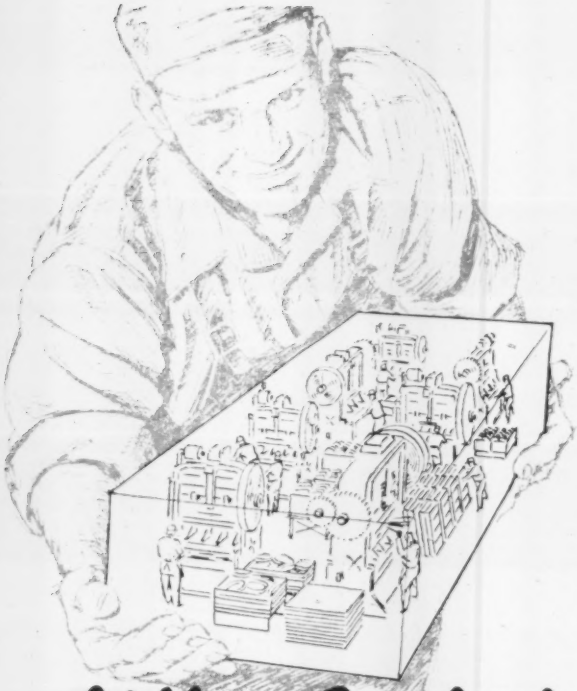
UNITED STATES STEEL



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Inserts Extend Tool Life

To strengthen and protect threads in tapped holes in aluminum housings and eliminate vibration wear, stainless steel helical - wound wire thread - inserts are installed in tapped holes of Ingersoll - Rand's Impactool. This hand tool is widely used for nut running, drilling, stud driving, masonry drilling, etc.

Steel bolts are used to join the the housing sections. If these bolts were screwed directly into the tapped aluminum holes, seizing and galling might occur during assembly, aluminum threads would be subject to damage by tool vibration during operation, and the housing's soft threads would wear when the tool is periodically disassembled for maintenance and repair. Installation of stainless steel Heli-Coil "liners" provides strong permanent threads which eliminate seizing, galling, and wear.

Inserts are installed by a mass-production setup, using a high-speed inserting tool. The inserting tool (rather than the workpiece) is clamped in a vise and the operator feeds inserts into the tool with one hand, holds the workpiece against the tool with the other, and operates the tool by a foot pedal.

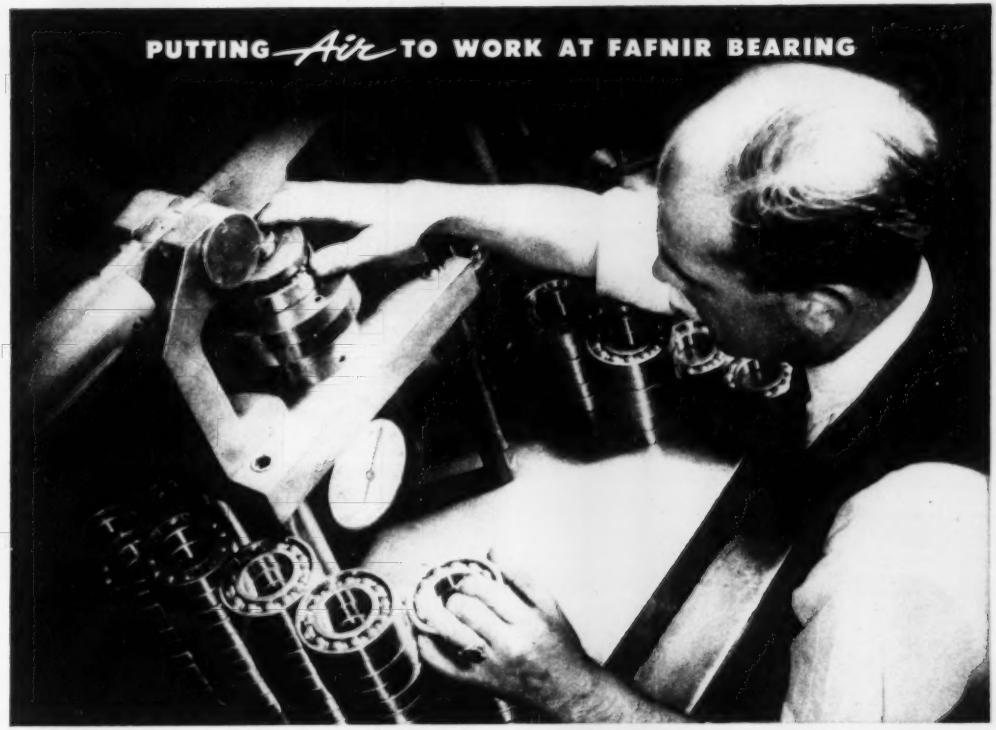
Heli - Coil inserts are precision-wound coils of 18-8 stainless steel having diamond - shaped cross - sections. When installed, the inside coil diameter, thread form, and pitch conform to the American National series of thread contours. In this application, one of three insert sizes is used—10-24, 1/4-20 or 5/16-18 — depending upon the particular model being manufactured. Lengths used are 1-1/2 times bolt diameter. Three housing-section holes in which inserts are installed are drilled with No. 8, 17/64, or 21/64-inch drills and tapped with Heli-Coil roughing and finishing taps 10-24, 1/4-20, or 5/16-18, depending on the Impactool model.

Instrument Book Available

Information concerning selection of electrical measuring instruments is provided in a 30-page instrument booklet available from the Westinghouse Electric Corp., Pittsburgh.

Seven basic selection factors are explained; types of instruments available in each major classification are listed on a full-page check chart; and, four typical selection problems are solved to help the reader make his selection.

Complete lines of portable, switchboard, panel, recording, and socket instruments are described and illustrated, and functions of each are ex-



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Tolerances to ± .0002" at final inspection are tough to gauge in dust-laden, humid air. A microscopic dirt particle can spoil the work of a hundred hands . . . if it interferes with the precision testing of finished ball bearings at The Fafnir Bearing Company. But Westinghouse *put air to work* . . . to solve their problem with an atmosphere control system, and PRECIPITRON®, the highly efficient electronic air cleaner.

Now, thanks to dust-free air and controlled atmosphere, Fafnir has eliminated those minute, production-crippling dirt specks. Mirror-like finishes on balls and races don't rust or corrode from excess moisture.

If your operations call for close tolerances—for precision machining, grinding, finishing or inspecting—there is industry-proven Westinghouse Air Conditioning equipment ready to help you increase production and cut costs. Call the nearest Westinghouse Sturtevant office, or write Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Massachusetts.

YOU CAN BE SURE...IF IT'S **Westinghouse**

PUTTING Air TO WORK

J-80214

AIR CONDITIONING

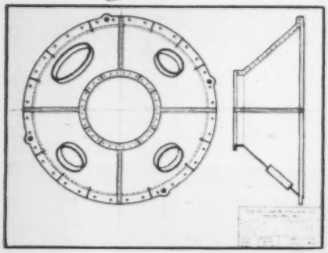
ELECTRONIC AIR CLEANERS

AIR HANDLING APPARATUS

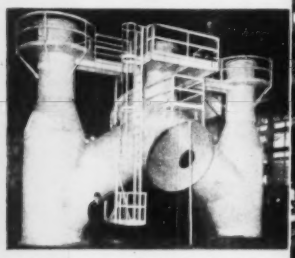
HEATING AND VENTILATING

INDUSTRIAL FANS

POLLOCK

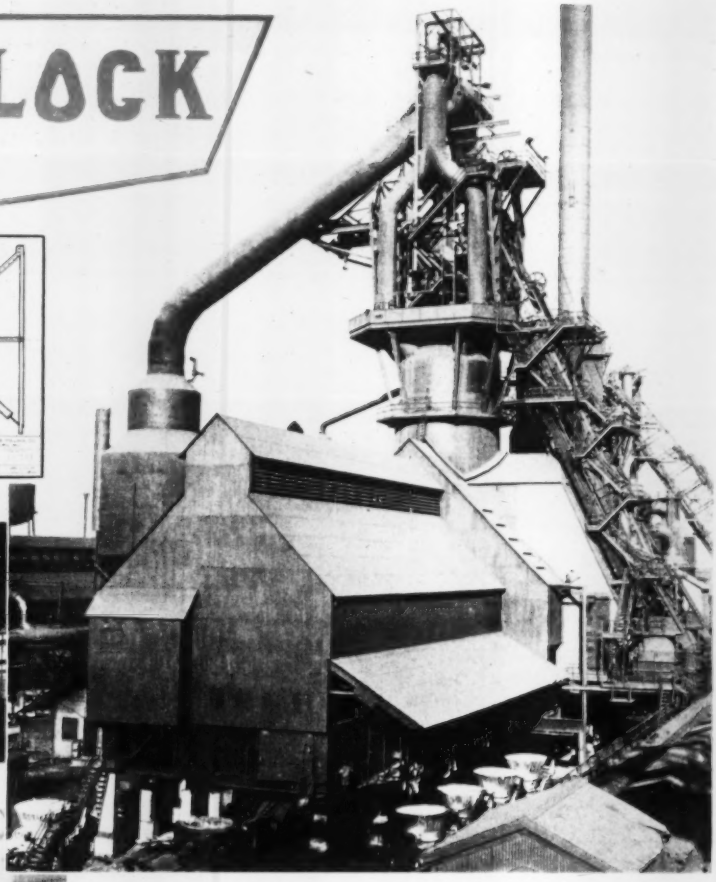


ENGINEERING



SHOP FABRICATION

FIELD ERECTION



Correlating the skills of Pollock engineering, fabrication and field erection to specific operational requirements of The Youngstown Sheet & Tube Company are evidenced in this blast furnace. In addition to furnishing the steel work for this blast furnace, Pollock designed and built auxiliary equipment, including the hot metal ladle cars and cinder cars shown in the above picture. The experience which the Pollock Company has gathered in over eighty-five years is available to you in planning your new projects.

Blast furnace STEEL WORK

POLLOCK

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN · OHIO
STEEL PLATE CONSTRUCTION · ENGINEERS · FABRICATORS · ERECTORS

BLAST FURNACES · HOT METAL CARS AND LADLES · CINDER AND SLAG CARS · INGOT MOULD CARS · CHARGING BOX CARS · WELDED OPEN HEARTH LADLES

plained. Descriptions of instrument auxiliaries are included.

For copy of booklet write to the company, Box 2099, Pittsburgh 30.

Foundry Practice Movie

A new educational foundry film dealing with core making has just been completed by Archer-Daniels-Midland Co., Foundry Products Division. It is a half-hour, full-color, 16mm, sound, motion picture. L. P. Robinson, vice president of the company, in making this announcement, explained that "The ADM of Cores", as the film is titled, is a semitechnical discussion of basic foundry core practice. Its purpose is to bring about a better understanding of the fundamental characteristics of core sands and core binders, thereby enabling foundries to improve the efficiency of all phases of their core production.

Much of the film's story is told by a core room superintendent, who, during a visit to ADM's core research laboratory, has an opportunity to study the performance of core materials under exacting laboratory conditions. He is shown why different

Cutting Blowpipe Takes Slice

GIANT hex nuts for a 250-ton hydraulic press are shaped by an Oxweld cutting blowpipe at General-American Transportation Co.'s shops in Sharon, Pa. Cutting the 24-inch thick low carbon steel billet at 3 inches per minute is an easy job for the equipment furnished by Oxweld Railroad Service Co., a division of Union Carbide & Carbon Corp., New York. After they are cut to shape, the nuts are threaded for column bolts in a hydraulic press and no further machining is required

ACCO SLING CHAIN Adjuster FOR UNBALANCED LOADS

PAT. NO. 2,436,247

FORMED POCKETS PREVENT SLIPPAGE

a New Idea!

Now any load can be lifted the easiest way it can be picked up. And perfect balance is maintained every time.

Sling hooks are attached to load, saddle moved to correct position along chain's links which fit in pockets of the ACCO SLING CHAIN ADJUSTER. Then load is ready for lifting. Twisting or spiking of chain is unnecessary. Made in sizes for ½", ⅜", ¾", and ⅞" chain.

Adds greater safety on level lifts

Prevents slippage on angle lifts

Provides control of unbalanced lifts

SEE your AMERICAN CHAIN distributor or write us for full information

ACCO

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AMERICAN CHAIN DIVISION
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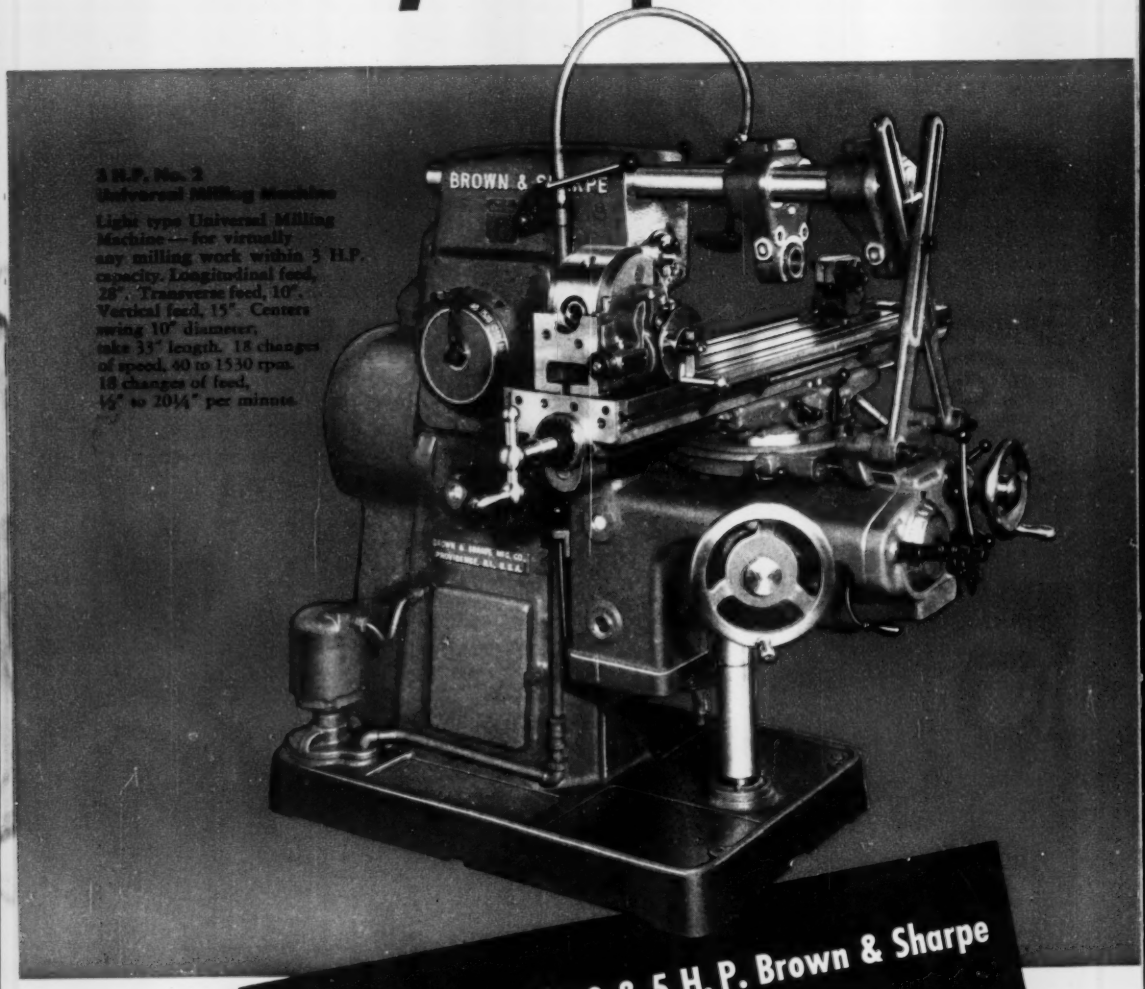
"Intentionally Better" SLING CHAINS

TRADE MARK

In Business for Your Safety

Thrifty Preparedness

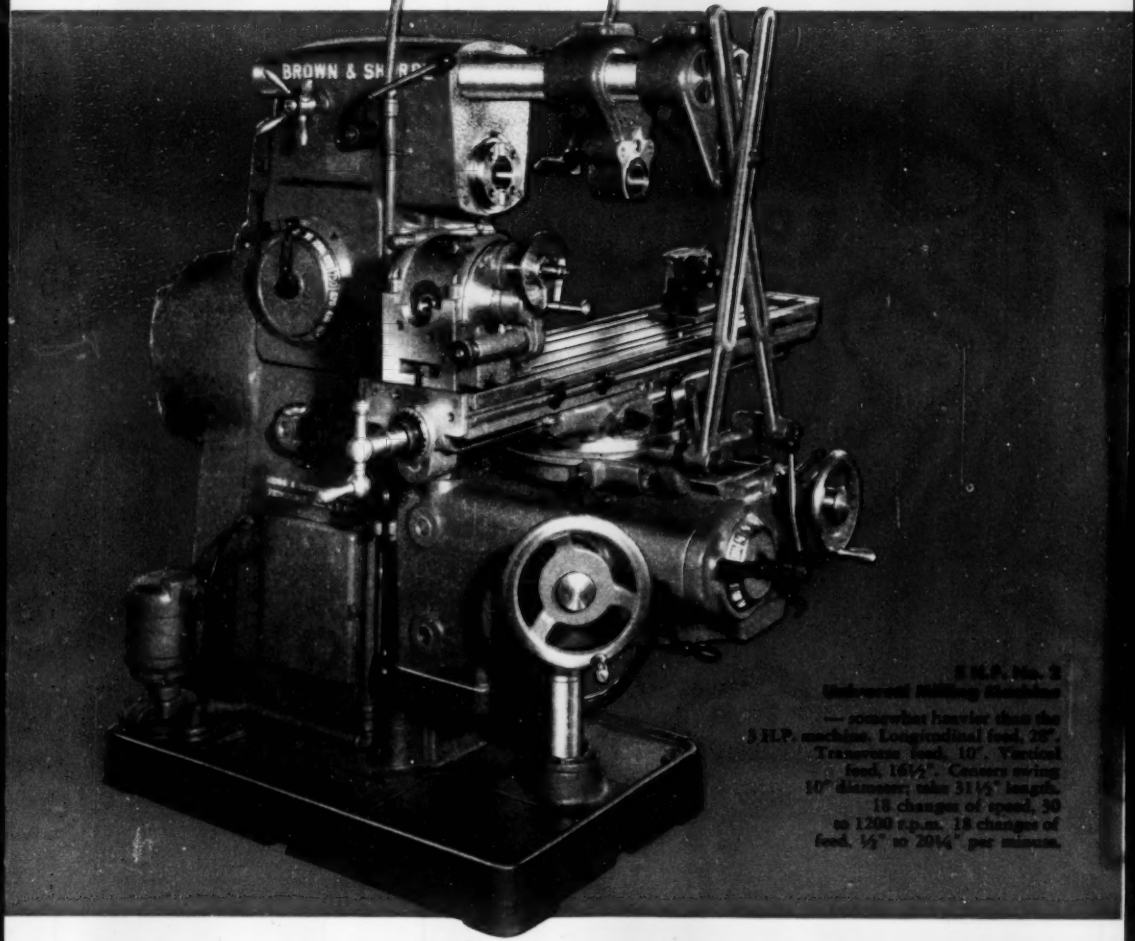


3 H.P. No. 2
Universal Milling Machine

Light type Universal Milling Machine — for virtually any milling work within 3 H.P. capacity. Longitudinal feed, 28". Transverse feed, 10". Vertical feed, 15". Centers swing 10" diameter, take 33" length. 18 changes of speed, 40 to 1530 rpm. 18 changes of feed, ½" to 20¼" per minute.

Shops equipped with 3 & 5 H.P. Brown & Sharpe No. 2 Universal Milling Machines have instant capacity for unusual as well as ordinary jobs

for all Milling Jobs...



5 H.P. No. 2 Universal Milling Machine — somewhat heavier than the 3 H.P. machine. Longitudinal feed, 28". Transverse feed, 10". Vertical feed, 16½". Centers swing 10" diameter; take 31½" length. 18 changes of speed, 50 to 1200 r.p.m. 18 changes of feed, ½" to 20¼" per minute.

The extra versatility of these Brown & Sharpe Universals equips you to meet sudden demands for change-overs in milling jobs quickly and easily — prepares you to keep production at a continuously high level in spite of changes in models or products.

With both of these machines, production benefits from the more efficient tri-motor drive — for spindle, table, and coolant.

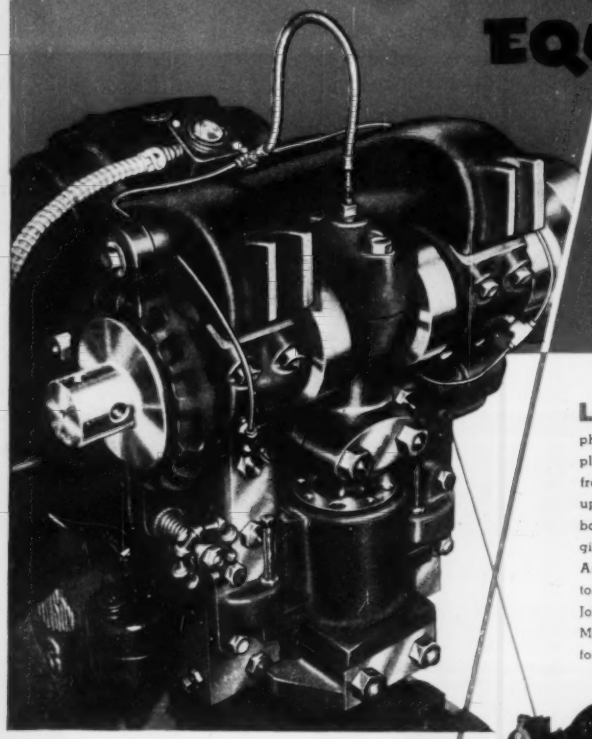
This system of three independent motors eliminates much friction loss, increases machine flexibility, and assures full power at the cutter.

Other production-boosting features include quick selection of speeds and feeds; convenient, time-saving controls; automatic lubrication; and extended spindle face. Write for detailed bulletins. Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

Brown & Sharpe B·S

IF YOU FAVOR RUGGED EQUIPMENT,

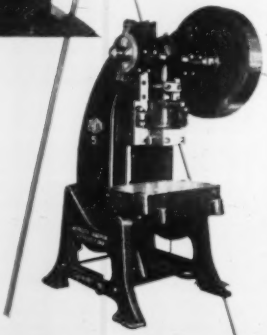
PUT INCLINABLE JOHNSON POWER PRESSES IN YOUR PLANT



LOOK INTO this stripped-down press photographed on the assembly floor at the Johnson plant. Judge for yourself what that cast semi-steel frame will take. See how the crankshaft measures up with other presses of similar rated tonnage at bottom of stroke. Consider Johnson's extra-long gibs that mean years of service on heavier jobs. And when it gets going . . . we'd need a movie to show the smooth action, of course . . . you'll find Johnson precision manifested in every working part. Might be worth your while to write Johnson, asking for a tip on nearby installations of our presses.

EXTRA SAFETY ONLY JOHNSON CAN OFFER

is a feature of every press we build. The exclusive patented Non-Repeating Safety Clutch protects workers and equipment, yet it is simple in its operation. Two activating springs work to hold trip lever in disengaged position. If one of two springs breaks, the other takes over. Should both fail, the clutch automatically disengages. Springs are easily replaced in 30 seconds without stopping machine.



MORE DIE SPACE

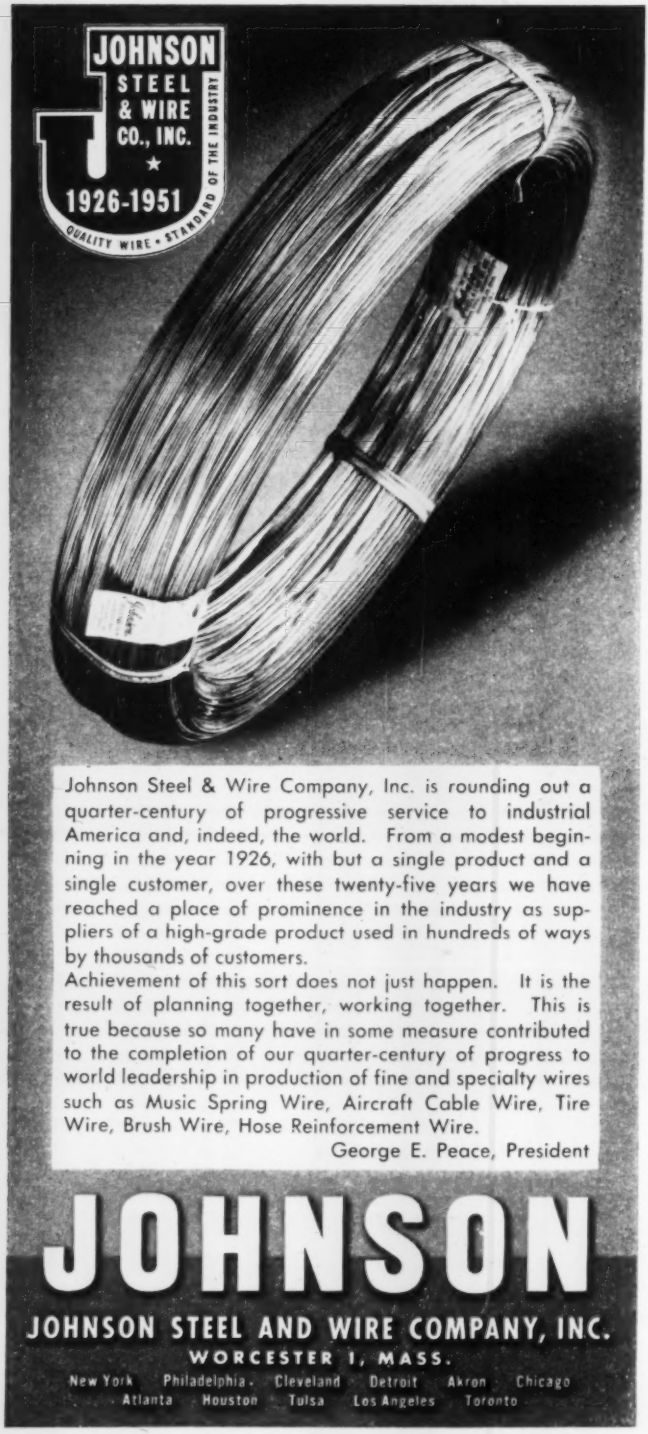
on all models from 16 to 90 ton capacity gives you a PRODUCTION BONUS. Johnson presses do more die work per dollar, make it possible to contract for a wider range of jobs without increased investment. For special heavy duty, Johnson builds an extra-thick bolster plate to stand the gaff . . . interchangeable with the standard bolster for ordinary production requirements.

Write **or call Johnson for FREE CATALOG of the six models of Inclinable Power Presses now being offered. Get Johnson's ideas for more work from presses, too.**

Johnson MACHINE and PRESS CORP.

620 WEST INDIANA AVENUE • ELKHART, INDIANA

For
NORTHERN
CRANES
improved electrical layout
For expedient field installation and wiring, all magnetic panels are mounted on a common support with all wires, where possible, contained in metal raceways having removable covers. Northern Cranes are completely wired in our plant with all wires having solderless connectors, whereby the usual field soldering is eliminated.
This improved method of wiring is another example of many fine features incorporated in the design of Northern Cranes, and illustrates the intensive thought exercised in their construction.
Write for Catalog 156-C
"Mounted on a Common Support"
NORTHERN ENGINEERING WORKS
General Offices: 2615 Atwater St., Detroit 7, Michigan
BUILDERS OF CRANES AND HOISTS EXCLUSIVELY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STEEL
& WIRE
CO., INC.
1926-1951
QUALITY WIRE • STANDARD OF THE INDUSTRY
Johnson Steel & Wire Company, Inc. is rounding out a quarter-century of progressive service to industrial America and, indeed, the world. From a modest beginning in the year 1926, with but a single product and a single customer, over these twenty-five years we have reached a place of prominence in the industry as suppliers of a high-grade product used in hundreds of ways by thousands of customers.
Achievement of this sort does not just happen. It is the result of planning together, working together. This is true because so many have in some measure contributed to the completion of our quarter-century of progress to world leadership in production of fine and specialty wires such as Music Spring Wire, Aircraft Cable Wire, Tire Wire, Brush Wire, Hose Reinforcement Wire.
George E. Peace, President
JOHNSON
JOHNSON STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.
New York Philadelphia Cleveland Detroit Akron Chicago
Atlanta Houston Tulsa Los Angeles Toronto

types of sands give different results in core mixture; how to use water as a supplementary binder; and what can be done to prevent the variations that eventually cause defective cores and castings. He learns the value of careful control and how it can be applied out on the core room floor as well as in the laboratory.

Prints may be obtained without cost for showing to any foundry gathering; association meeting, supervisory or foremen club meetings, and apprentice training classes, schools and colleges conducting foundry instruction. Write to 2191 W. 110th St., Cleveland 2.

Aluminum Reduction Described

A new booklet showing how its Jones Mills, Ark., plant produces aluminum pig by the electrolytic reduction process, has just been published by Reynolds Metals Co. It pictures two new 800-foot long buildings which house the new pot line just put into operation to add some 42 million pounds to the plant's yearly capacity.

The plant's original rated capacity of 144 million pounds was provided by eight potrooms, each with 64 pots. Early in 1951, 8 million pounds new capacity was obtained by adding 32 pots, four in each of the eight potrooms. Now with the addition of the two new potrooms, there are ten potrooms each with 68 pots, and total plant capacity is 194 million pounds yearly.

Jones Mills has one of the world's largest engine-generator plants, including 18 diesel-electric sets, 50 gas-electric sets and two dual-fuel units . . . 70 engines driving direct-current generators with a capacity of 1,730,000 kilowatt-hours daily. In addition, some 2,550,000 kilowatt-hours daily are purchased outside. A large mercury-vapor rectifier station changes all purchased power from alternating to direct current. This station is shown and described.

Revealed in the booklet is how these huge quantities of electricity are used in aluminum production. It explains the electric reduction process for producing aluminum from alumina and pictures the equipment.

A carbon plant, which makes almost 400,000 pounds of carbon electrodes daily, is also covered in the booklet which will be sent without charge by writing to 2500 S. Third St., Louisville.

Resistance Welding Nickel

A new technical booklet concerning resistance welding of nickel and high-nickel alloys has been issued by the Development and Research Division of International Nickel Co. Inc. It contains 32 pages illustrated by

AJAX *Induction Furnaces—*

help HOOVER to cut die-casting costs by efficient melting and pumping of Aluminum

FIG. 1

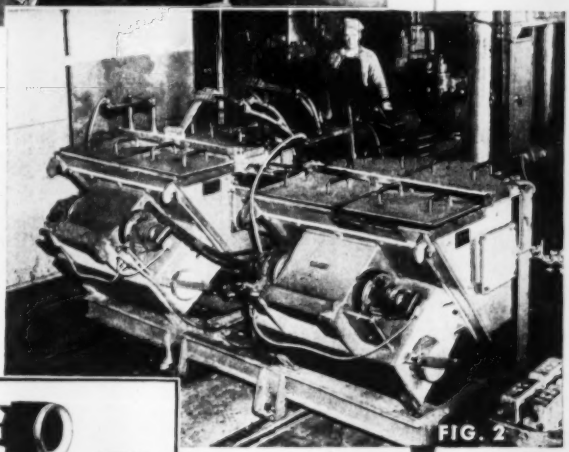


FIG. 2

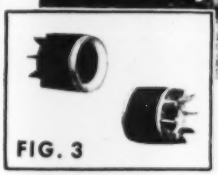


FIG. 3

Fig. 1 shows nozzle of AJAX electromagnetic pump discharging metal into cold chamber of die-casting machine

Fig. 2 shows AJAX melting furnace and electromagnetic pump installed in front of die-casting machine

Fig. 3 shows Hoover squirrel cage aluminum cast rotors

CASE HISTORY

COMPANY: The Hoover Company, Kingston-Conley Division, Cambridge, Ohio, plant.

PROBLEM: To conserve scarce copper supply by use of aluminum as a substitute.

To cut die-casting costs in the manufacture of squirrel cage induction motor rotors without sacrificing performance characteristics.

SOLUTION: Installation of the LOEWY-HYDROPRESS die-casting system, in which several sizes with various end ring designs are made in same die by simple change of inserts. AJAX INDUCTION FURNACE AND ELECTROMAGNETIC PUMP used to melt and pump high-purity aluminum. Low frequency induction principle with precise controls keeps metal at constant temperature. Automatic electromagnetic pump discharges exact amount needed to fill die, eliminating hand ladling.

RESULTS: Combined melting and die-casting set-up so excellent that the Hoover plant converted completely to aluminum die-cast type within 2½ months.

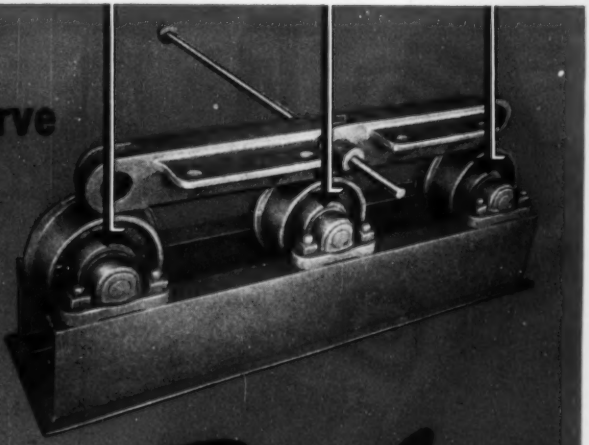
AJAX TAMA-WYATT

AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

These Wheels Serve You Best by STANDING STILL



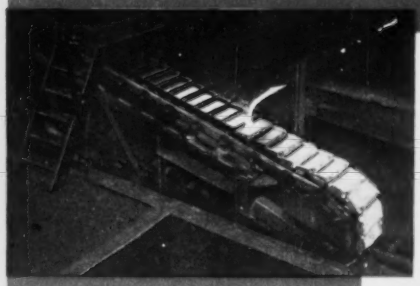
Bailey

STATIONARY WHEEL PIG CASTING MACHINES

Correctly designed for greater production . . . longer service

Increased casting capacity, reduced maintenance and operation costs—these are your benefits from the "stationary wheel" design of Bailey Pig Casting Machines. Bailey Machines feature large diameter idler wheels permanently mounted at intervals on the frame. Along these stationary flanged wheels runs an endless chain of moulds. Through this design 80% of the moving parts of conventional machines are eliminated, and the wheels are located as far as possible from casting heat.

Rugged in design and construction, Bailey Pig Casting Machines have been thoroughly proved by service in ferrous and non-ferrous smelters and foundries.



Foundry Type

Completely self-contained, the complete unit includes the machine proper, motor gear unit, variable speed reducer and drive. Only an electrical connection is required for operation. Capacities: 2 to 50 tons. Sizes: 15 to 125 feet in multiples of 5 feet.

Blast Furnace Type

For heavy duty pig casting this machine is built in sizes from 125 to 250 feet long. Supplied with either single or double strand, it runs over 10 inch diameter idler wheels which assure smooth operation at all speeds. Stationary wheel design assures lower power demands, simplified lubrication of the idler wheels, and no vibration while the pig is solidifying.

1221 BANKSVILLE ROAD PITTSBURGH 16, PA

drawings and photographs. Also presented are tables on mechanical properties, chemical compositions, recommended conditions for welding and other information.

Copies are available without charge from the Technical Service section of Inco's Development and Research Division, 67 Wall St., New York.

New Industrial Two-Way Radio

A new low-power two-way radio that utilizes their Uni-Channel Sensicon receiver has been designed by Motorola to meet the accelerating demand of industrial radio installations. It meets Federal Communications Commission regulations that allow a maximum power input of 3 watts to the final amplifier for those industries where all two-way radio communications are carried on within a single plant area.

They can be installed, either as base stations or as mobile units. They can be mounted and used on fork-lift trucks or other intra-plant vehicles to speed materials movement, eliminate deadheading time, and reduce total number of vehicles needed.

These small, compact transmitter-receiver units are available either as a single package with built-in speaker and control head, or with individual speaker and control head. Models are available for operation from either 6 or 12 v, dc, or 117 v, ac primary power source.

Maintenance Kit Offered

A new plan to help industry get the most productivity from its existing facilities has been announced by General Electric Co. Called "productive maintenance", it is designed primarily to assist maintenance engineers in setting up a program to minimize lost production time and forced idleness due to equipment failures. In addition, it will provide better spare parts control, smoother production flow, and enable industry to gain optimum output from existing equipment, according to GE engineers who worked on its development.

Productive maintenance, as outlined recommends an adequate staff of trained maintenance men, armed with tools needed to perform properly the functions of regular, routine checks of operating equipment, and planned outage of this equipment at regular, scheduled intervals. Rebuilding and modernizing machines during time of planned outage is done readily with an adequate stock of mechanical and electrical renewal parts. To help the maintenance engineer materially, GE offers a file-size package of maintenance aids to guide him in setting up a working

"RUDOLPH SAYS HE KNOWS THE TAPS WOULD LAST LONGER IF HE HAD THE RIGHT CUTTING FLUID ON THE MACHINE!"

USE OF the *right* cutting fluid for the job *makes taps last longer,* conserves critical tool steel, minimizes down-time, increases output. A typical example:

A large instrument manufacturer changed to Stuart's THREDKUT for tapping Allegheny metal.

	Before Using ThredKut	After Using ThredKut
Tap Life	2 hours	8 hours
Production	180 holes per hour	400 holes per hour

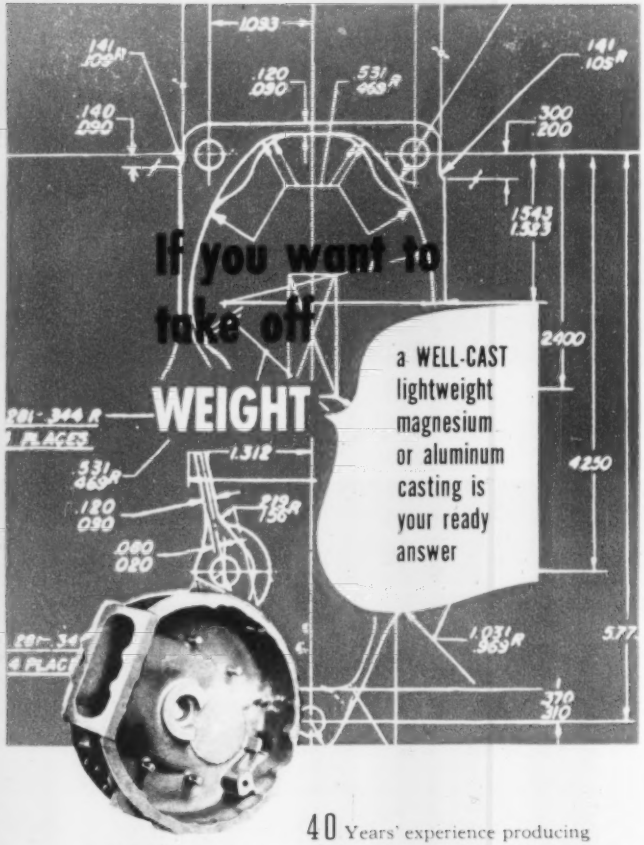
You just cannot ignore the fact that the cutting fluid used is a major factor in any machining operation. A Stuart Representative is prepared to show you how Stuart combines theory and practice to give you better operating performance. Ask to have him call.

Are you receiving Stuart's Shop Notebook regularly? Write, wire or phone.

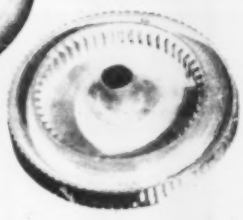
CONSERVE TOOLS
Use the Right Cutting Fluid

STUART SERVICE
Goes with every Barrel

D.A. Stuart Oil CO.
2735-37 S. Troy St., Chicago 23, Illinois



40 Years' experience producing quality lightweight castings for the aircraft, textile, pneumatic tool, automotive, domestic appliance, and other diversified industries everywhere.



Well-Made Wood and Metal Patterns
Ampco Bronze Castings

THE WELLMAN BRONZE & ALUMINUM CO.

2521 EAST 93rd STREET • CLEVELAND, OHIO

program. The kit contains an instruction bulletin, a typical balance sheet for keeping historical data on each machine, planned outage forms, and checklists for motors, control, and other equipment.

To supplement the kit, a new slidefilm, "Productive Maintenance", will be available this fall for showing through local GE offices. It explains how productive maintenance can benefit every industrial plant.

Proposed Packaging Practice

A proposed simplified practice recommendation for packaging, marking, and loading methods for steel products for domestic shipments has been submitted to the steel manufacturers, steel warehouses, railroads, users of steel products, and others interested for their acceptance or comment, according to a report made by the Commodity Standards Division, Office of Industry and Commerce, U. S. Department of Commerce.

Many millions of dollars are expended annually by industry and government agencies for packaging all kinds of articles. It is generally conceded that the solution of packaging problems is of prime importance and numerous committees are devoting much time and attention to development of improved methods.

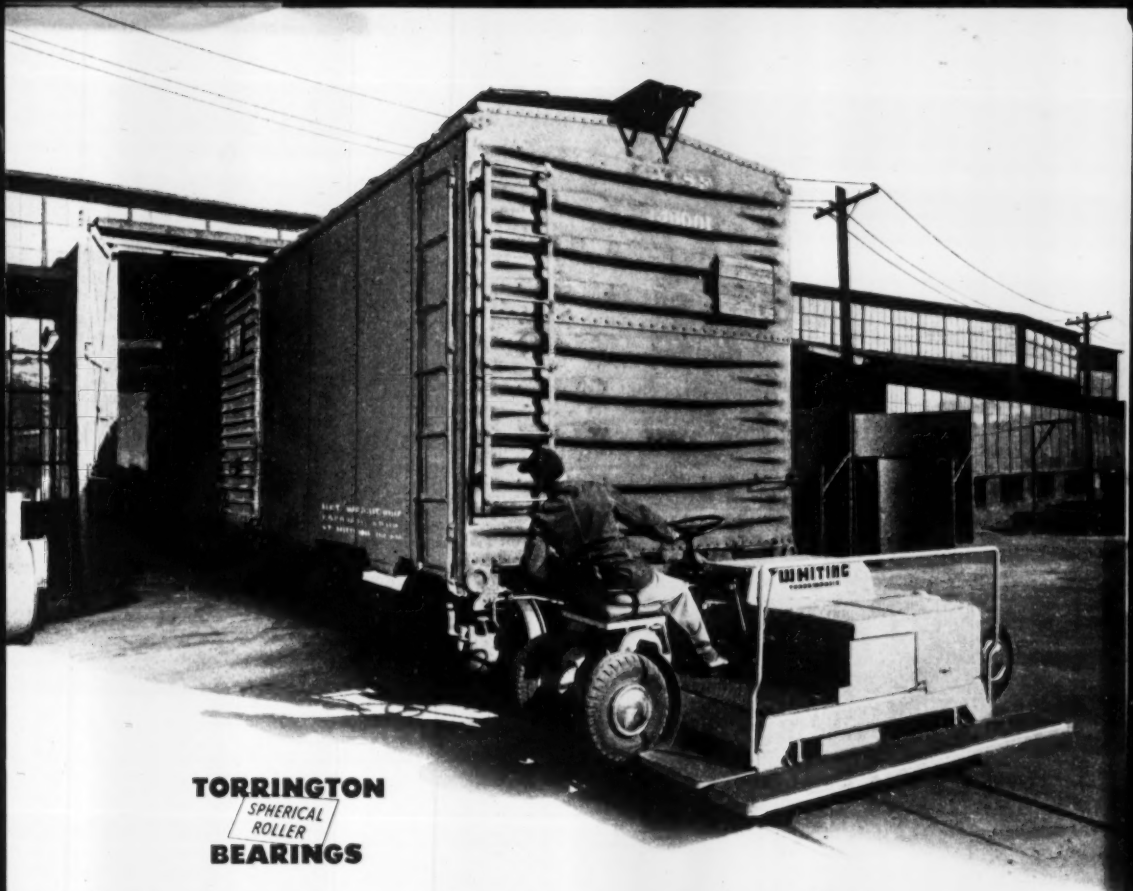
The Committee on Packaging, Loading and Shipping Problems, of the American Iron & Steel Institute, prepared this proposed recommendation for packaging, marking and loading methods, based on results of years of experience in delivering steel products by various methods of tranportation.

When approved by industry this proposed recommendation will be used as a guide in attaining uniformity in the packaging of steel products for domestic shipments.

Booklet On Copper Corrosion

For 25 years, the technical staff of the American Brass Co. has conducted continuous laboratory research and field study on the nature of corrosive attack on copper and copper alloys. Results of these studies have been published now in a 24 - page booklet, "Corrosion Resistance of Copper and Copper Alloys."

This publication, first of its type in the industry, explains both chemical and physical nature of corrosive attack in its various forms. Included is a tabulation indicating the relative corrosion resistance of the principal types of copper and copper base alloys when in contact with 183 different corroding agents. It is available without charge from the company's office, Waterbury 20, Conn.



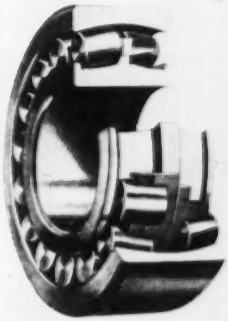
TORRINGTON SPHERICAL ROLLER BEARINGS

riding herd on railroad cars

Whiting Corporation's amazing Trackmobile drives from the road right onto the tracks, where it spots, switches and hauls railway cars with ease. The Torrington Spherical Roller Bearings in the track axles deliver smooth, even power—unaffected by the heaviest loads.

Self-aligning Spherical Roller Bearings absorb binding stresses despite long center distances or possible shaft deflection. A minimum of maintenance is required.

Your heavy-duty equipment can benefit from the automatic self-alignment and precision quality of Torrington Spherical Roller Bearings. Our engineers will be glad to help you work out details of design and application.



THE TORRINGTON COMPANY

South Bend 21, Ind. • Torrington, Conn.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON SPHERICAL ROLLER BEARINGS

SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • BALL • NEEDLE • NEEDLE ROLLERS

FOR THE CITY OF

TOMS RIVER, New Jersey

With her population more than doubling during the summer season, the resort city of Toms River, New Jersey was facing a serious water shortage. Five old, inefficient and not too dependable wells were being operated with suction pumps. Layne was called in for a discussion of what could be done with limited funds. Layne's recommendations resulted in a contract for the rebuilding and re-equipping of one old well and the drilling and equipping of a new one. The contract also called for an auxiliary, gasoline engine drive on one of the pumps for use in case of electric power failure. Without delay everything was finished according to the contract, giving the city of Toms River a water supply that more than fulfills their present needs.

Layne handled everything complete in one inclusive contract that saved the city officials much time, useless expense and unnecessary worry. Layne offers this same type of service to any city or industrial plant in need of more well water.

NEW CATALOGS

Layne offers, without obligation, a wide range of catalogs and bulletins on well water systems, short coupled service pumps, oil and water lubricated pumps, irrigation wells and pumps, etc. You may obtain copies by addressing

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

Layne
WATER SUPPLY
WELLS & PUMPS

New Books

Processing of Metals

Metal Processing, by Orlan William Boston, professor of metal processing and chairman, department of metal processing, University of Michigan; cloth, 763 pages, 6 x 9 inches; published by John Wiley & Sons Inc., New York, for $7.50; available from STEEL, Penton Bldg., Cleveland 13, O.

The second edition of this book is completely revised. A chapter on surface quality has been added and chapters on machinability, machine tool drives, covering electric motors and hydraulic pumps, both with their controls and circuits, have been enlarged. Detailed information on machine processes, accessories and tools are provided as the author illustrates the correlation between design of the part, metal of which it is made and manufacturing of the product.

Steps involved in designing for production are covered in the first chapter. Subsequent chapters discuss the various classes of machines and the processes and factors with which they are involved. All the information needed for complete preparation of routings including selection of machine tools, cutting tool materials, tool shapes, power, speeds and feeds and all accessories involved in the plant layout and manufacture is given. New technical data developed during and since World War II are also incorporated.

This well-illustrated book gives engineering specifications and standards and lists reading references for more detailed study.

Solving Inventory Problems

Management of Industrial Inventory, by Benjamin Melnitsky; cloth, 278 pages, 6 x 9 inches; published by Conover-Mast Publications Inc., New York, for $4.25; available from STEEL, Penton Bldg., Cleveland 13, O.

The author portrays the inventory problem in all its many and varied aspects. By means of case histories and examples of worthwhile practices in many companies, he has demonstrated what is being done to solve this problem. In some cases, he also suggests what might be done.

Evaluation of the role of inventory in modern industrial management is presented in the first section and a brief for centralized control over manufacturers' stocks is also presented. Great stress is placed on the man element in inventory management. In the next chapters standardization is presented as a positive means for attaining the co-ordination that is essential to successful inventory. The

PAGE WIRE

ROUND
FLAT
OR
SHAPED

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front office portion of the inventory picture is discussed in the next section. Systems and methods for record-keeping, budgeting, purchasing accounting and obsolescence control are offered.

The next chapters examine the shop segment of inventory control and discuss the problems of receiving, storing, identifying, inspecting and handling of materials, parts, work-in-process, supplies and finished inventory items. Discussion of techniques and methods of physical inventorying complete the book.

Many types of forms used in the process are illustrated. A subject index is also included.

Designing for Mass Production

Handbook on Designing for Quantity Production, by Herbert Chase; cloth, 564 pages, 5½ x 9 inches; published by McGraw-Hill Book Co., New York, for $7.50; available from STEEL, Penton Bldg., Cleveland 13, O.

The purpose of the second edition of this book is to provide engineers with tested rules to follow in designing parts for quick and economical mass production. It gives complete explanations of high production processes, and tells what to do and what to avoid in designing for each.

Part I includes specific chapters devoted to the most important types of metal products. Specific rules are given and the reasons for each rule are explained. Ample illustrations are used to indicate how the rules are applied. It covers design of die castings, sand castings, permanent mold castings, screw machine products, stampings, impact extrusions, die-forged parts. Other chapters discuss hot heading, cold headed parts, wire forms, sintered metallic powder compacts and plastic moldings.

In Part II various types of products manufactured in quantities are compared with one another and reasons are given why one type is chosen over some other in actual industrial applications. Comparisons are made with actual production costs and tabular comparisons. Study of these chapters should be helpful in choosing type of design likely to be best adapted for economical manufacture in particular instances.

Techniques for Plant Layouts

Plant Layout, by Randolph W. Mallick and Armand T. Gaudreau; cloth, 391 pages, 6 x 9½ inches; published by John Wiley & Sons Inc., New York, for $7.50; available from STEEL, Penton Bldg., Cleveland 13, O.

This practical book was written with the administrative executive

SUBCONTRACTORS

brazing essential aluminum assemblies should have the help of their

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Complicated aluminum parts can be joined simultaneously and economically by brazing. See your local Alcoa Distributor.

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and plant engineer in mind. It was also developed as a handy guide for senior and junior engineers and as a reference for engineering colleges and schools of business administration. It features complete engineering techniques for plant layout projects.

It is divided into four parts. Part 1, approach to plant layout, discusses role of plant layout in management, ascertaining the need for a re-layout, range of new layout and re-layout projects, basis for designing a plant layout, benchmarks used in plant layout work and techniques of plant layout engineering. Part 2, planning the processing department, explains framework of plant layout procedure; determining the capacities for the design; analyzing, balancing and routing operations; planning and equipping the work station; internal transportation of plant material, planning the material handling project.

In Part 3, designing plant service facilities, subjects discussed are receiving, shipping and warehouse areas; storerooms and storage facilities; test areas, inspection points, and dispatch stations; maintenance facilities, tool cribs and sprinkler systems; power and lighting systems; planning office layouts; employee service facilities.

Part 4, justifying the layout project, covers buildings for housing the plant layout, capital outlays for plant and equipment and presenting the proposal to the management.

The well-illustrated book is concluded with a bibliography and subject index.

Conference Proceedings

International Conference on Hot Dip Galvanizing; cloth, 161 pages, 6 x 10 inches; published by Zinc Development Association, Oxford, England.

This book is an account of the proceedings of the first international conference on hot dip galvanizing, held at Copenhagen, July 17-21, 1950, with revised texts of the ten papers presented and the discussions on them. The conference was organized by the Zinc Development Association on behalf of the Hot Dip Galvanizers Association.

The editors have rearranged the subject matter into chapters and have included a few revisions in consultation with the authors. Chapter headings are: Fundamental aspects of hot dip galvanizing; heating of galvanizing baths and equipment; relative merits of flux galvanizing and dry galvanizing; galvanizing residuals and their treatment; corrosion resistance of galvanized coatings; future of general galvanizing. A list of references and a subject index are also included.

Designing Machines

Introduction to Mechanical Design; by T. B. Jefferson and Walter J. Brooking; cloth, 612 pages, 6 x 9 inches; published by Ronald Press Co., New York, for $6.50; available from STEEL, Penton Bldg., Cleveland 13, O.

Objective of the authors in preparing this volume is a textbook which not only has a completeness from the practical viewpoint, but also follows closely the mode of creative thinking of engineers who are actually designing machines, rather than consider their elements as individual and separate theoretical problems. Subject is approached as a whole in the light of functional purposes of a machine, its configuration requirements, economic considerations, use of rational and empirical design data and desired final appearance, endeavoring to place all these in proper perspective as they are weighed by the designer.

A number of design considerations are discussed. Materials are emphasized because many new materials becoming available to designers are progressively changing basic approach to mechanical design. As an understanding of manufacturing processes and their costs are inseparable from an intelligent consideration of materials and their utilization in design, processes are quite fully discussed.

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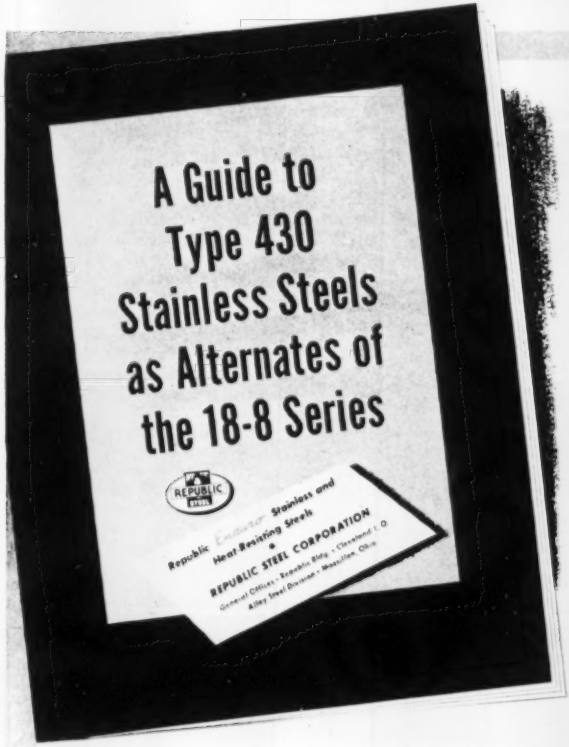
A Guide to Type 430 Stainless Steels as Alternates of the 18-8 Series
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Republic Enduro Stainless and Heat Resisting Steels
REPUBLIC STEEL CORPORATION

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Teamed up for longer life under pressure

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FOR pressure service . . . for almost *any* severe service . . . it's hard to match Shenango *centrifugally* cast Meehanite Metal.

First, Shenango's centrifugal process means a uniform, high-strength, pressure-dense casting, free from sand inclusions, blow holes and other defects. Next, in Meehanite Metal you have finer graphite flakes, always more evenly dispersed, thus avoiding stress concentrations and permitting a finer finish.

So here's a combination you just can't beat for wear-life . . . for resistance to abrasion, pressure or shock . . . for long-range *economy!*

If *your* plans call for essentially symmetrical parts, large or small, rough, semi- or finish-machined, check with Shenango. Get *all* the facts! Informative bulletins are yours for the asking.

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Dover, Ohio
Executive Offices, Pittsburgh, Pa.

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Special consideration is given to machine frames as the frame greatly influences factors of cost, function and configuration of the machine. Lubrication in connection with bearings, oil seals and gears is emphasized. Also considered are pipes, tubing, tanks and containers, styling, streamlining and finishing of machines.

Many tables, photographs and drawings are used throughout the book.

Changes in Steel Productivity

Productivity in the Blast-Furnace and Open-Hearth Segments of the Steel Industry: 1920-1946, by William T. Hogan, S.J.; cloth, 150 pages, 6 x 9 inches; published by Fordham University Press, New York, for $4.00; available from STEEL, Penton Bldg., Cleveland 13, O.

This study considers the significant changes in productivity in two segments of the industry—blast furnaces in which pig iron is produced and open-hearth furnaces which are the source of steel ingots—from 1920 to 1946. Physical volume, that is man hours per ton, costs of production; detailed methods of operation, advantages and disadvantages of new methods, success of new inventions and adaptations are each discussed and analyzed in full.

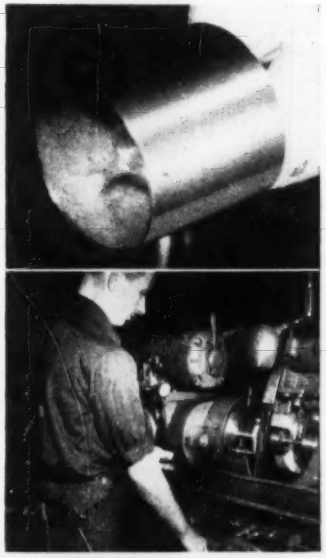
After presenting the introduction and scope of the study the following chapters discuss productivity surveys and claims; concept of productivity; technical improvements in blast-furnace plant and process; blast-furnace plant productivity, 1920-1946; technical improvements in the open-hearth plant and process; open-hearth plant productivity, 1920-1946. The final chapter presents the findings of the study and conclusion.

This is followed by an appendix, bibliography and index. Many line drawings are used to illustrate various points.

Can Handle Devised

To solve a problem traceable to the scarcity of tin-plate, Sherwin-Williams Co., Cleveland, has invented a clamp-on type of handle for paint cans of black plate. Sherwin-Williams converted to black plate in the manufacture of cans for their oil base paints. It is impractical, however, to solder ears on black plate—as on tin—for the conventional can handle.

A snap-on tempered wire handle was devised which hooks beneath the top rolled edge of the can and rests in the cover groove. The handle is quickly attached, easily removed, and may be used repeatedly if necessary. Because of the radical departure in design from the conventional handle, a patent application has been made.



Photos courtesy of Universal Winding Company

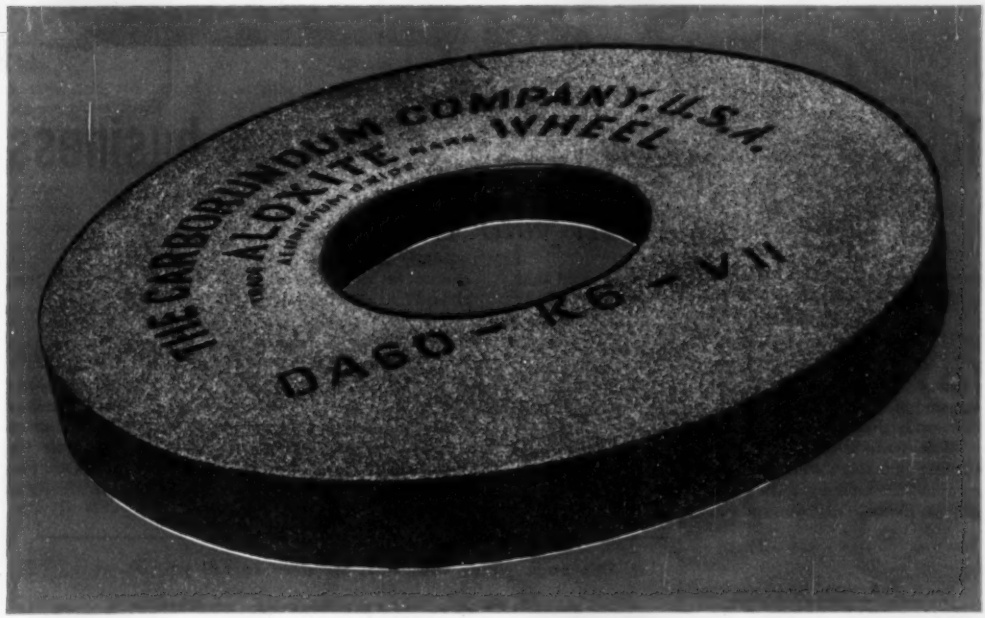
Smooth as silk...to protect nylon

Because delicate nylon must pass over these rolls without danger of damaging rips—the stainless steel surface must be ground to the smoothest of finishes.

Universal Grinding Company reports that V11 Bond grinding wheels are perfect for the job because of excellent form holding qualities at reduced grinding pressures.

Cool, free cutting action produces superior finishes to close tolerances; more rapid stock removal results in high production rate.

Why not investigate the advantages of V11 Bond Wheels by CARBORUNDUM in your cylindrical grinding operations? See your local CARBORUNDUM salesman or distributor—or write Dept. S 81-27



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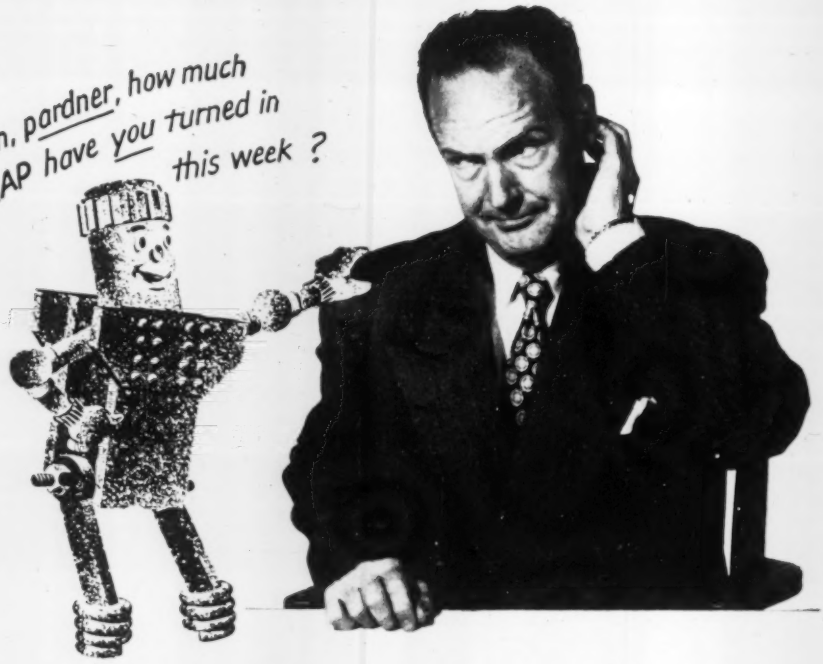


Today, the steel business is your business

—*it needs all your SCRAP, Now!*

SUPPOSE that every steel user were suddenly told that he had to turn in a half-ton of scrap before he could get a ton of steel. It would start the most gosh-almighty treasure hunt for scrap that ever happened.

In effect, this "no-scrap, no-steel" situation virtually exists. For without *all* the scrap that industry can search out and start on its way to the mills, steel production will surely drop. It's as serious as that.

More scrap is urgently needed. Today the mills are turning out more steel than ever before. But they're scraping the bottom of the barrel as far as scrap is concerned. Defense and domestic demands for steel simply cannot be met unless at least 100,000 tons of "purchased" scrap roll into the furnaces—*every day.*

The bulk of this scrap must come from industry. That's why we're asking for your all-out help. That's why it's so important that you make the drive for scrap part of your daily operations. Make it your business to encourage every employee to report any obsolete, broken or worn-out machinery, tool or equipment that has seen its day. From this dormant "junk" must come the heavy melting scrap that the mills need most. Don't let your scrap lie idle; send it on its way. How about it, pardner?

You'll find your local scrap dealers listed in the yellow pages of the phone directory.

This page would ordinarily be used to tell you about

OUR STEEL WAREHOUSE SERVICE

but, because steel cannot be produced without SCRAP, we are asking instead for your all-out help in getting more SCRAP to the mills.

UNITED STATES STEEL SUPPLY COMPANY
WAREHOUSES COAST-TO-COAST

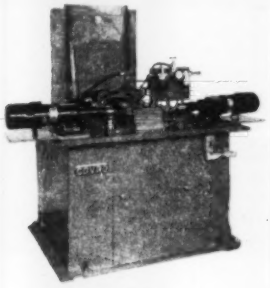
1-1326A

UNITED STATES STEEL

New Products and Equipment

Radial Holes Tapped Quickly

A machine for speeding up the tapping of radial holes is announced by Govro-Nelson Co., 1933 Antoinette, Detroit 8, Mich. Setup incorporates four model ST tapping units and is designed for tapping four 5/16-18 holes in a mild steel bracket. By varying number and position of the units,



machine can be adapted to other tapping operations.

Operator loads the machine manually, touches the starter switch and the part is automatically clamped by means of an air cylinder. The four units then automatically tap the holes simultaneously. Upon completion of tapping the part is automatically unclamped. Output is at the rate of about 480 pieces per hour.

Check No. 1 on Reply Card for more Details

Specializes in Cylinder Blocks

A two-way horizontal Holetapper capable of tapping 47 holes in 20 automotive cylinder blocks per hour is a development of National Automatic Tool Co., Richmond, Ind. Production is approximately 20 parts per hour.

All operations are automatic. The left hand head performs the following tapping operations: 11 holes to $\frac{3}{4}$-inch pipe tap; 4 holes to $\frac{1}{8}$-inch pipe tap; 2 holes to 5/16-inch pipe tap; 5 holes to $\frac{3}{8}$-inch 16 tap and 1 hole to $\frac{3}{8}$-inch NPT. Tapping operations performed by the right hand head are: 13 holes to 7/16-inch 14 tap; 6 holes to $\frac{3}{4}$-inch pipe tap; 4 holes to $\frac{1}{2}$-inch 13 tap and 1 hole to $\frac{1}{8}$-inch pipe tap.

Check No. 2 on Reply Card for more Details

Torque Rating Increased

By using two secondary pinions to drive the output gear, U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54, Calif., has doubled the effective torque rating of a conventional single pinion and gear unit. Incorporating the use of a splined herringbone pinion to equally divide the load between the two secondary pinions, type GL Syncrogear produces high torque at low speeds while occupying minimum space.

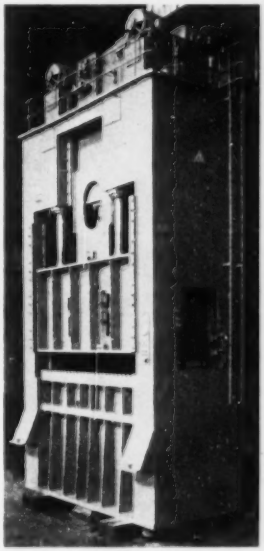
Available with ratings of 5 to 25 hp and speeds from 30 to 84 rpm, this motor series features asbestos-protected windings, normalized castings, and solid centricast rotors.

Check No. 3 on Reply Card for more Details

Quick Change Press

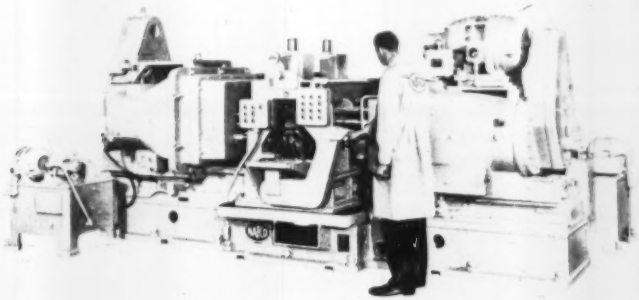
Adaptability to a variety of work is a feature of the double action hydraulic press built by Clearing Machine Corp., 6499 W. 65th St., Chicago 38, Ill. Press has a frame capacity of 1500 tons, the punch slide delivering 1000 tons and the blankholder slide 500 tons. Maximum stroke of the punch slide is 80 inches and the press is arranged to draw and lift out a 30-inch piece.

Bed is 96 x 162 inches. Auxiliary filler plate or sub-bolster is supplied so that minimum shut height may be as little as 20 inches for first draw or shallow die work. Removal of the auxiliary filler plate makes



the minimum shut height 50 inches. Three pressing speeds are available in addition to the quick advance and return. Each speed can be used singly in conjunction with the quick advance and return, or any sequence of pressing speeds can be used. This means seven sequences of automatic operation may be chosen by means of selector switches on the control panel. Selector switches also permit choice of double action operation, single action operation with or without the blankholder added and inching control.

Check No. 4 on Reply Card for more Details



Steering Made Easier

Improved wheel design on the model YT-40 fork lift truck manufactured by the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore., makes for easier steering and reduces operator fatigue. Dual wheels are supplied on a steering trunnion instead of a single wheel.

Gear ratio in the steering mechanism is reduced to 20.7 to 1, requiring seven turns of the steering wheel to swing the trunnion 120 degrees.

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SIXTY-EIGHT YEARS OF
SERVICE TO INDUSTRY

Tire size of the 4000-pound capacity truck is reduced to provide interchange with tires on the model having half the lifting capacity.

Check No. 5 on Reply Card for more Details

Tilting Spindle Grinder

Master spindle sander and grinder made by Kindt-Collins, 12653 Elmwood Ave., Cleveland 11, O., features a tilting spindle rather than a tilting table. Job on which the operator works is always in a horizontal position. It can be used oscillating or

nonoscillating, can be tilted from 0 to 45 degrees by a worm and gear unit and can be locked in place at any desired position.

Other features include a lighted periscope for easy reading of accurate settings, a 2 hp motor with choice of 2000 and 4000 rpm speeds, adaptability of abrasive sleeves from 1.1 to 4 inches in diameter and 6 to 11 inches in length, and grinding wheels up to 5 inches in diameter and 5 inches high. A built-in safety device prevents use of the high speed with the large diameter units.

Check No. 6 on Reply Card for more Details

Low Speeds for Driven Shaft

A countershaft drive which comes as a complete unit and provides wide variations for a variety of applications is offered by Speed Selector Inc., 118 Noble Ct., Cleveland 13, O. It is designed for installations where driven shaft speeds must be lower than motor shaft speeds. Unit utilizes 7 and 8-inch combination sheaves and is available for drives from 2 to 15 hp.

Assembly consists of a sealed ball-bearing countershaft stand, secured by rigid slide rods to an adjustable motor support for all motor sizes up to NEMA No. 326. Built-in control can be mounted in any one of a num-

HOW DOES *Your* GARDEN GROW?

THIS IS BASIC

If you think to maintain profits by increasing prices your prospect is gloomy; for increased prices have a way of hatching increased costs, and bringing their broods home to roost.

To maintain profits, decrease costs!
Decreased costs operate to your benefit three ways.

1. Profits are increased.
2. Competitive position is improved.
3. Distribution is simplified.

All of which is good . . . . None of which is bad.

PORTELVATOR®
REDUCES COSTS

Portelvator, the original worm — worm gear — screw propelled, four-point supported, three table surfaced portable elevating table, will reduce your costs in seven astonishing ways*, by substituting an efficient application of economical, mechanical lifting for your most expensive component . . . brawn.

DO YOU KNOW "THE FORMICA STORY?"

In requesting our Portelvator Bulletin No. P-504, ask also for a copy of "The Formica Story" and learn how one Portelvator user increased manual effectiveness by 800%. Both pieces of literature are free; obey that impulse; write now!

***Ask us about the seven spheres of Beneficent Portelvator Influence.**

THE Hamilton TOOL COMPANY
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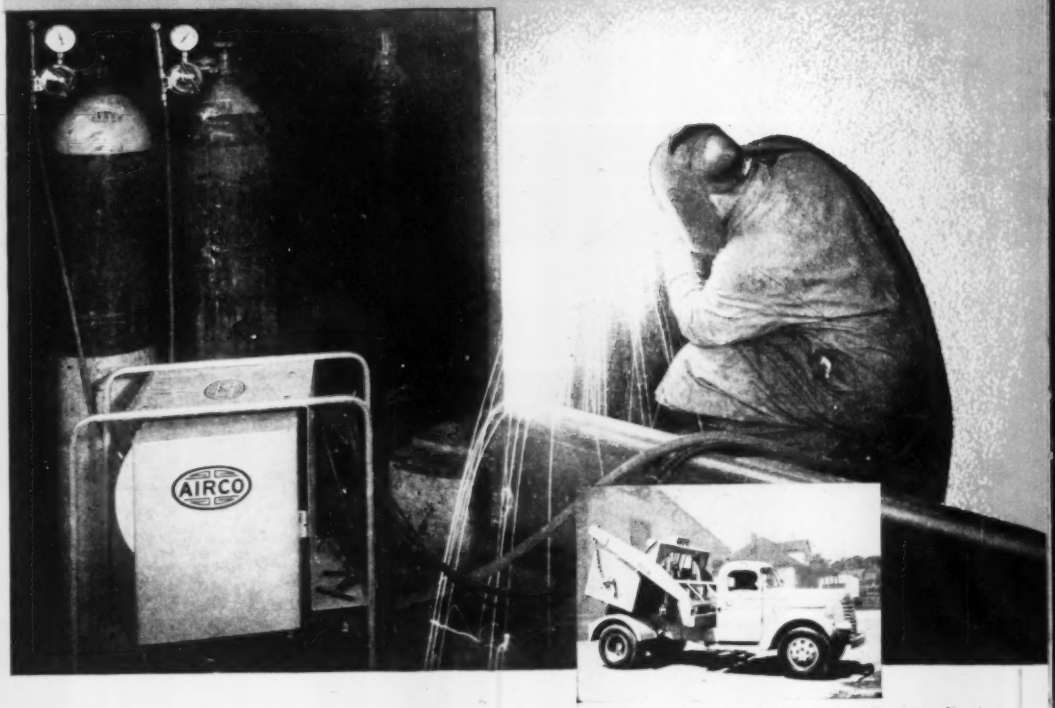
NEW Aircomatic® Process jumps Welding Speeds to NEW HIGHS



Aircomatic is a new metal arc welding process that permits high-speed welding of aluminum, of aluminum bronze and of stainless steel — *in all positions.*

The process uses a bare wire electrode in coil form, continuously fed to the work within an inert gas shield. High current densities are used providing excellent penetration and high deposition rates, *permitting welding at speeds greater than ever before possible.*

Aircomatic welding has proved most economical . . . for its high deposition rate, in addition to permitting high travel speed, also makes possible fewer passes on heavy material, and faster, heavier deposits for overlay or build-up work. This means more weld per unit of arc time, whatever the job. Further, since the wire is bare and continuously fed through a shield of inert gas, electrode changes and slag removal interruptions are eliminated, thus permitting almost 100% arc time in using the high operating speeds.

SAVES 16 MAN-HOURS WELDING TIME . . . Dempster Brothers, Incorporated of Knoxville, Tenn., makers of the nationally-known "Dempster-Dumpster" found Aircomatic welding cut their aluminum container manufacturing costs.

The other method was slow — cumbersome, and ran the cost exceedingly high. With Aircomatic the same container was produced — at a welding cost reduction of approximately 16 man-hours.

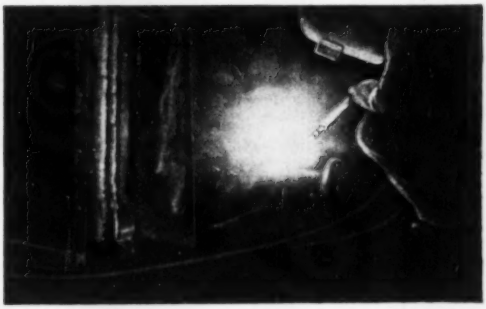
Another important feature of Aircomatic welding is its minimization of distortion. This is due to its high speed operation (heat can be concentrated and moved rapidly along the work), plus the fact that a small amount of weld metal is all that's required in most joints.

The case studies on the opposite page show how this dramatic new welding process is helping others. While the facts and figures are startling, they could very easily be applied in your own shop . . . but find out for sure. Write . . . or phone your nearby Airco office. Ask for a copy of ADR 66: "Aircomatic Welding Process".

SAVES 4½ HOURS ... Martin-Quaid Co., of Philadelphia, Pa., used the New Aircomatic Process to reduce the time and cost of welding huge stainless steel cylinders used in the manufacture of carpets. They found this revolutionary process cut materials cost 25% ... and saved 4½ hours working time over the old method – and, at the same time, greatly increased the quality of the finished product.

REDUCES TIME 4/5'S ... Consolidated Welding and Engineering Company, of Chicago, Ill., adopted the new Aircomatic process for welding aluminum separators. Immediately, major production and cost problems were solved: To weld one complete separator assembly took only 90 man hours – about 1/5 the time of other methods.

Further, Aircomatic's high current density and the attendant high welding speed confined the heating effects to the narrow weld-zone ... completely eliminating distortion.



ELIMINATES LEAKS ... Griffin & Company, of Louisville, Ky., found Aircomatic's high speed and the ability to make welds without interruption ideally suited to the fabrication of tanks for all-aluminum evaporative coolers. Production time and cost was cut to the minimum, and warpage and distortion were completely eliminated. Thus far, the company has made hundreds of these tanks without a single leak.

BOOSTS PRODUCTION 71% ... The Stewart-Warner Corporation, South Wind Division, Indianapolis, Ind., join the upper and lower halves of its "Safe-Air Gas Home Heater" with the completely new, high-speed Aircomatic Process. This time-saving, cost-cutting process skyrocketed production 71% ... and cut manufacturing costs in proportion.

A new Aircomatic motion picture "The Tool For The Job" is available for specialized groups. Ask your nearest Airco office about showings.

AIRCO

AIR REDUCTION

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REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
Divisions of Air Reduction Company, Incorporated
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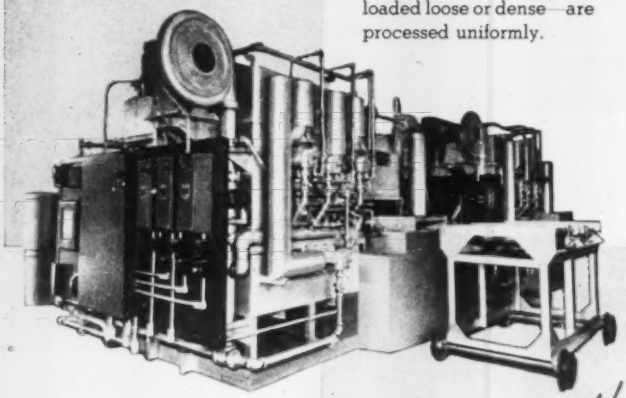
...BLAZING THE HEAT-TREAT TRAIL...

New Production-line Holcroft batch-type furnace

This compact heat-treat furnace has a vestibule, heating chamber, quenching tank—all above floor level and in one unit.



does more jobs...

You'll be able to handle a wide variety of jobs at temperatures ranging from 400° to 1700° F., and get clean, scale-free work. All contamination is removed by a high flow of generator gas in the vestibule. The furnace fan circulates atmosphere so that parts—loaded loose or dense—are processed uniformly.

faster...

The furnace can be operated automatically, or manually, by push-button controls. To save time, the temperature is built up between cycles to a point higher than necessary; then the normal operating temperature control is resumed after the cool parts enter the furnace. The quench tank handles the full load in one operation.

at a lower cost!

The furnace requires minimum floor space, no pit for the quenching tank. It can be moved easily—as a unit—to any part of the production line. Trays last longer because they are carried—*not* pushed or pulled while hot.

Want more information? Write us today!

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HOLCROFT & COMPANY DETROIT MICH

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

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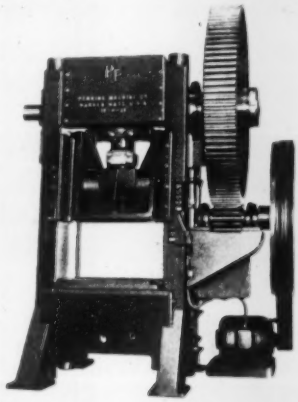
CLEVELAND 15 — Wallace F. Schott, 1900 Euclid Ave.
HOUSTON 1 — R. E. McArdle, 5724 Navigation Blvd.
CANADA — Walker Metal Products, Ltd., Windsor, Ontario
EUROPE — S. O. F. I. M., Paris 8, France

ber of positions to suit the requirements of the installation.

Check No. 7 on Reply Card for more Details

Single Crank Press

Model 12-H-36 straight side single crank press announced by Perkins Machine Co., Warren, Mass., has a capacity of 200 tons and gives both economy in operation and upkeep. Bed area is 36 x 36 inches and main



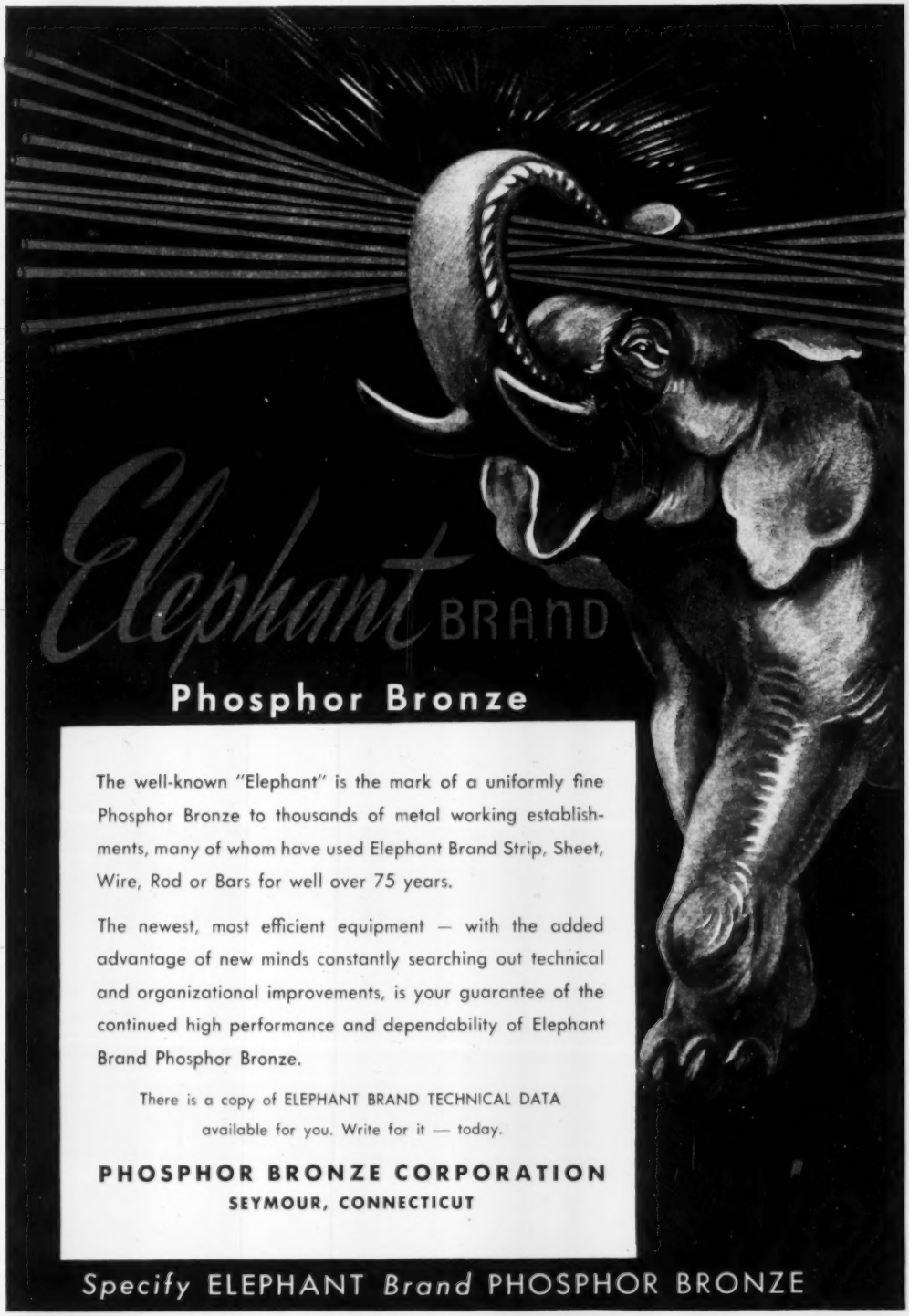
bearing is 8 inches in diameter. Press is designed for convenience in operation and for accessibility in changing dies. A wide variety of work is accommodated by the large bed.

Check No. 8 on Reply Card for more Details

Guideless Tube Straightener

Seven straightening rolls are employed in the KTC straightener announced by Sutton Engineering Co., Bellefonte, Pa. One group of three rolls is mounted at the entry end of the machine and another group of three rolls at the delivery end of the machine. Each roll group is composed of one large driven roll and two idler rolls disposed at an angle of approximately 120 degrees to each other. Located between the two three-roll groups is a middle idler roll which serves the purpose of deflecting the pipe during the straightening operation. This arrangement eliminates the use of all guides and at the same time positively confines the bar or tube to the pass line throughout the straightening operation.

A feature of the straightener is the automatic roll angling device. As the machine is set for stock size by means of power operated screwdowns all rolls except the middle pressure roll are automatically adjusted to the proper angularity for the size of bar or tube being straight-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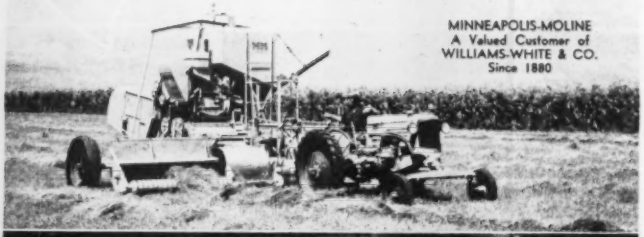

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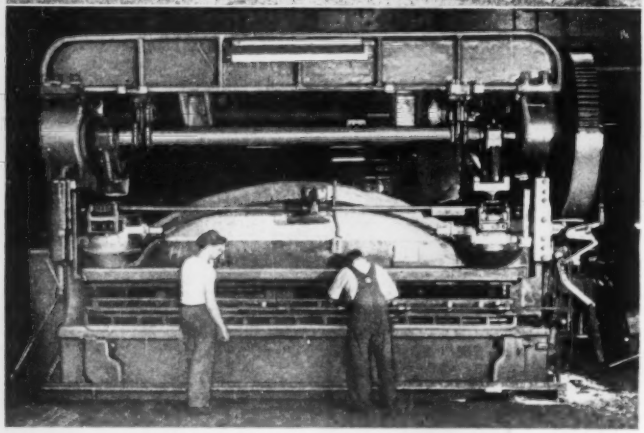


QUALITY in the tools of production results in long service, efficiency and economy in products for the home, the farm and for National Defense.

This large press is one of many WILLIAMS-WHITE machines in daily production at MINNEAPOLIS-MOLINE. Here, it is being set up to run a quantity of angle bars used in the header of the M-M G-4 Harvester, shown above.

Getting scrap metal off the farm is a Safety Measure

MAKERS OF QUALITY PRODUCTION TOOLS FOR NEARLY 100 YEARS

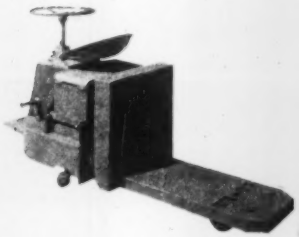
WILLIAMS-WHITE & CO.
702 THIRD AVE., MOLINE, ILLINOIS

ened. Middle pressure roll is manually adjusted for angle by means of two accessible handwheels. Straightening speeds normally vary between 60 and 240 feet per minute using a 200 hp, 300/1200 rpm adjustable speed direct current motor. The units are built in all sizes for 5/16-inch up to 20-inch OD tubes and bars ranging in size from $\frac{5}{16}$ to 12 inches in diameter.

Check No. 9 on Reply Card for more Details

Special Lifting Platform

Load-Mobile electric lift truck manufactured by Market Forge Co., Everett, Mass., is equipped with a narrow lifting platform for special applications. Width of the standard platform is 18 inches and can be furnished in 6, 7, 9 and 11-inch lowered



heights to engage conventional platforms. Trucks can be built as narrow as 15 inches to meet special conditions.

Stabilizing casters are placed on each side of unit to eliminate tendency to tip in making sharp turns. Casters are spring-mounted and in normal operation clear the floor, being called into action only when unit tilts. Truck is battery-operated and features three-way operating positions.

Check No. 10 on Reply Card for more Details

Wide Speed Range

Adjustable-speed motor system developed by Baldor Electric Co., 4353 Duncan Ave., St. Louis 10, Mo., is fundamentally a Ward-Leonard system of speed control for operation from polyphase or single phase alternating current circuits. It consists of three units: Motor-generator set, a controller and a drive motor, any of which may be mounted any distance from the others and in any position. A single controller provides 16 forward and 16 reverse steps of speed adjustment of 150 rpm each to a total of 2400 rpm and provides full dynamic braking. A vernier rheostat may be connected in the circuit if finer adjustment is required.

Glass insulation is used where practical. Excitation is by a full-wave

"Tool life on Inconel rivets up 35% with Gulf Electro Cutting Oil"

SAYS THIS GENERAL MANAGER

"Because we specialize in tough machining jobs, we know that there's a big difference in cutting oils," says this General Manager. "On Inconel aircraft rivets, for example, we get much better results with Gulf Electro Cutting Oil. Production is up 35%, and tool life is excellent:

Form & cut-off tools—500-600 pieces per grind
Carboloy box tools—800 pieces per grind
Center spotting tool—500-600 pieces per grind

Here's the important reason why Gulf Electro Cutting Oil delivers such outstanding performance. Thanks to a special Gulf process of combining sulphur, it provides greater sulphur activity over the entire range of a cutting operation. This intensified chemical action means better protection for the tool at elevated production rates—helps reduce built-up edge, prevents chip welding, prolongs tool life.

Operators like it because they get these production advantages without the disagreeable odor ordinarily associated with sulphurized cutting oils.

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Your present wheels may be doing a good job, but is it good *enough?* Can your figures equal Electro's for pounds of metal removed? Quality of finish achieved? Savings in time and effort costs? And life-lengthening durability of wheels?

Your operation may be so special that an individual blending of grit types, such as friable, regular and/or durable, will get the results you hope for. Maybe a blending of grit sizes will turn the trick. Even blending of resin bondings may help.

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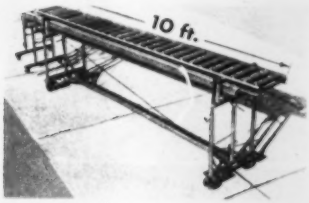
rectifier of the Tungar type. Sizes are ¾ through 3 hp for operation from polyphase circuits and ¾ through 1½ hp for operation from single phase circuits.

Check No. 11 on Reply Card for more Details

Telescopic Conveyor

A roller type conveyor being made by the Wilkie Co., 5520 Arch St., Philadelphia 39, Pa., supplements the skate wheel type. It is capable of carrying heavier loads than the skate wheel type and is recommended for objects not having a rigid, flat bottom. It is telescopic, easily pulled-



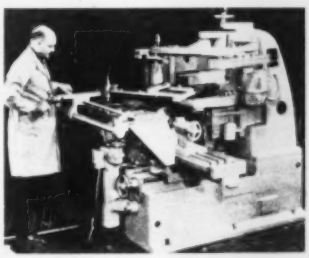
out or pushed-in to follow the load for quick pickup and delivery. Mounting on heavy casters permits rolling the conveyor from one job to another. On shipping platforms it goes right into a truck, trailer or freight car and reduces carrying to a minimum.

Unit is supplied in 12 and 18-inch widths. Nine different lengths are available which extend to a maximum of 30 feet.

Check No. 12 on Reply Card for more Details

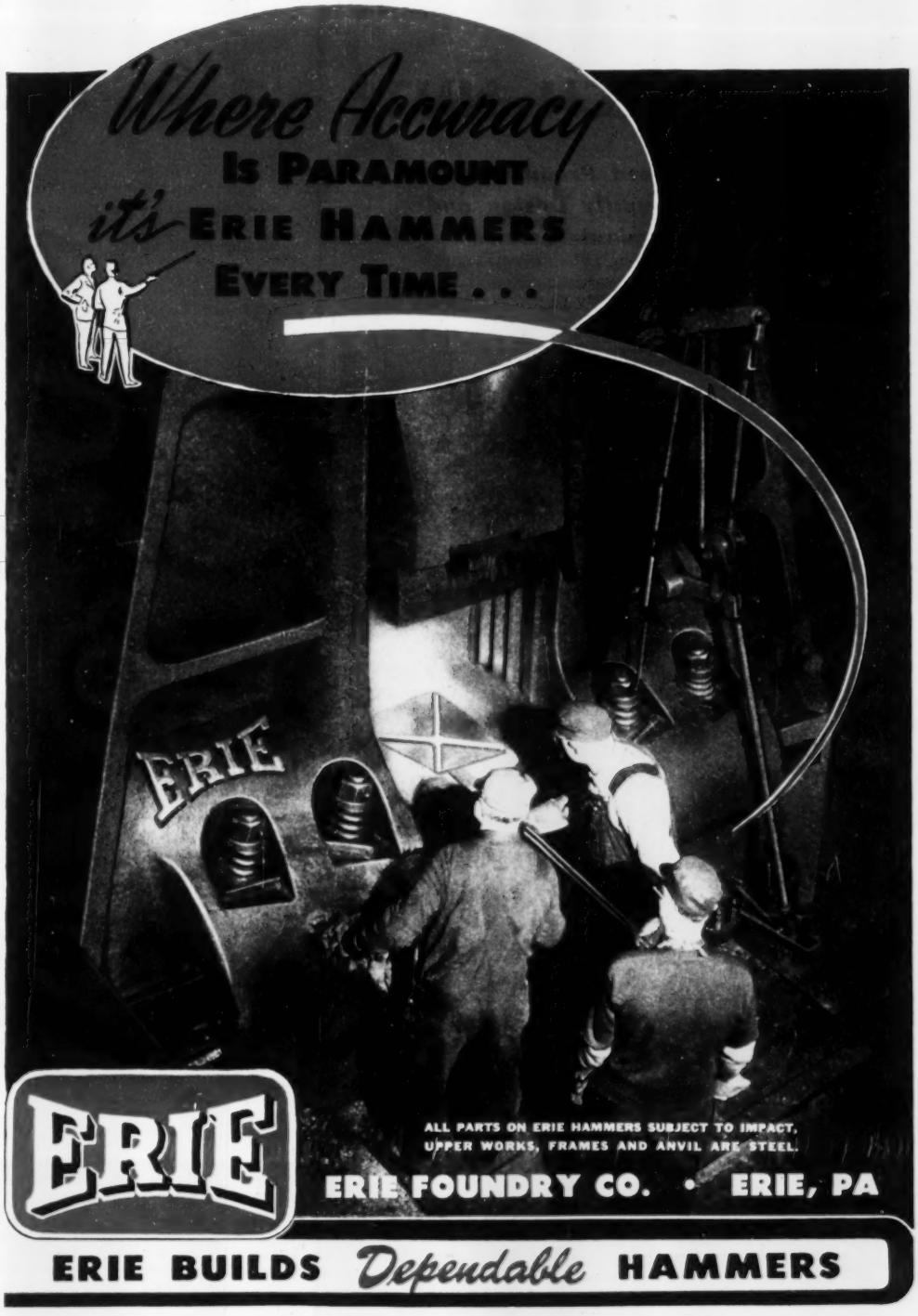
Mills, Routs and Engraves

A pantograph machine has been designed and built by George Gorton Machine Co., Racine, Wis., to do accurate milling, routing and engraving completely around cylinders and rolls. It can be used wherever rolls



are used to print, emboss, deboss and die cut various materials.

Machine accommodates rolls from 6 to 12 inches in diameter, up to 40 inches long and made of ferrous or nonferrous metals or plastic. Maxi-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Eliminate Service Problems

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Write for engineering data sheets on selecting and attaching FABRISTEEL "FAST-ON" CLINCH NUTS. You'll come up with some answers that will impress you, because "FAST-ON" CLINCH NUTS permit use of lighter gauge stock, kick up production and reduce costs.

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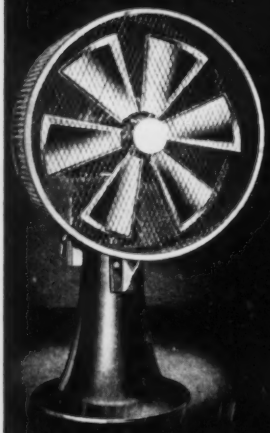

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mum area covered by the cutter at one setting is 5 x 20 inches. A master pattern is cut in flat brass, sheet iron, zinc or sheet plastic in either sunk or relief form and twice the desired size. Only a small segment or section is required of the entire design if it is to be repeated all around the roll. Then the master is clamped to the master table at front of machine ready for tracing.

Check No. 13 on Reply Card for more Details

Sliding Head Screw Machine

Type R10 high speed sliding head Swiss automatic screw machine developed by Tornos Works Ltd., is being distributed by Carl Hirschmann Co., 30 Park Ave., Manhasset, N. Y. Headstock moves longitudinally in order to impart axial feed to the

bar while the bar revolves with the spindle. This feature enables the bar to be guided in a bushing right in front of the tools, enabling long and slender parts to be turned accurately and with close concentricity.

Axial movement of the headstock is derived from an adjustable cam-operated mechanism called Radiax. Headstock slide is long and free from any undue reaction from the spindle drive. Thrust of chucking mechanism is absorbed by the machine bed and not by the headstock. Chucking can be operated in any position of the headstock without new adjustment. Normal stock capacity is $\frac{5}{8}$-inch and spindle bore is $\frac{1}{2}$-inch. Speed range is 1050 to 10,000 rpm.

Check No. 14 on Reply Card for more Details

Direct-Acting Switch

General Control Co., Boston 34, Mass., offers the du-op switch for use in numerous applications requiring a compact, lightweight limit switch. As a direct-acting switch,

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Every year sees new refinements, new speeds in steel production. Open hearths, electric furnaces are tapped oftener and for greater tonnages. Steel strip whizzes through pass after pass at better than a mile a minute. Giant presses stamp out whole auto bodies at once.
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Tolerance Control
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Engineering Service
Field Service
SKF
BALL AND ROLLER BEARINGS

it has no inherent characteristics of bounce. Mechanical lost motion is eliminated because instantaneous contact is made at the same fixed point of repetitive plunger travel.

Check No. 15 on Reply Card for more Details

Carbide Tipped Hammer Bit

New England Carbide Tool Co. Inc., Cambridge 39, Mass., offers Thunderbolt carbide tipper hammer bit for drilling hard concrete or granite. It fits any electric or pneumatic chipping hammer. Taper is proportioned to withstand crystallization.

Check No. 16 on Reply Card for more Details

Three-Position Indicator

A remote reading three-position indicator is announced by Riverside Metal Co., Keystone Watch Case Division, Riverside, N. J. It consists fundamentally of a rotating card that exhibits one of three printed symbols at a round observation window in one end of the instrument. It may be used to report pressures in factory hydraulic or air circuits and to maintain checks on levels of lubricating oil, coolant, chemicals and other liquids held in reservoirs.

Check No. 17 on Reply Card for more Details

Bronze Bearings

Additional sizes of Bost-Bronz oil impregnated porous bronze bearings are available from Boston Gear Works, Quincy 71, Mass. They are interchangeable with solid bronze bearings. There is no oil drip or waste and no openings for grit, lint or dirt.

Check No. 18 on Reply Card for more Details

Covers for Machine Tools

South Bend Lathe Works, South Bend 22, Ind., offers a new plastic waterproof service cover for the protection of machines against the harmful action of grease, water and dust whenever they are idle. It is available in six sizes: 12 x 28 x 28 inches; 21 x 37 x 24 inches; 32 x 48 x 17 inches; 32 x 60 x 17 inches; 38 x 72 x 25 inches and 38 x 96 x 25 inches.

Check No. 19 on Reply Card for more Details

Resists Severe Abrasive Wear

EutecChrom 2X, introduced by Eutectic Welding Alloys Corp., Flushing, N. Y., for alternating or direct current arc welding is a FrigidArc flux-coated alloy that deposits strong, dense overlays with good corrosion resistance at lower amperages. The hard overlay electrode is recommended for use with carbon and alloy steel surfaces that are subjected to severe abrasive wear and comparatively mild impact.

Check No. 20 on Reply Card for more Details

Automatic Feed

Producto Machine Co., Bridgeport 1, Conn., has developed a new positive action automatic feed for stamping presses. Known as Surefeed, it is mounted directly on the die set. Stock up to 2 inches wide and 0.045-inch thick can be advanced by this feed through movement of the press.

Check No. 21 on Reply Card for more Details

Solenoid Contactors

Bulletin 4458 size 0, alternating current solenoid contactors, introduced by Ward Leonard Electric Co., Mt. Vernon, N. Y., are compact multipole units designed for both load and control circuit use in controllers for machine tools and similar control applications. They are available in three and five-pole forms.

Check No. 22 on Reply Card for more Details

Cup Type Unit Mount

Robinson Aviation Inc., Teterboro, N. J., offers a new all-metal No. 1 size cup type unit mount. Designated as series 7001, it is available in five load ranges from $\frac{1}{2}$ to 10 pounds. Features include built-in damping with auxiliary cushioning for overload and shock, vibration isolation which exceeds applicable specifications and requirements through a wide range of temperature and operating environment.

Check No. 23 on Reply Card for more Details

Flow Meter

A new differential type flow meter that has functional design, gives fast and accurate response over an entire range is offered by Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia, Pa. It is available either as a mechanical flow meter with integral recorder or an electrical transmitter to be used with a Brown inductance bridge receiver. It is supplied in three ranges: 53, 119.25 and 212 inches of water and for 750 and 1500 psi static pressure.

Check No. 24 on Reply Card for more Details

Electric Hammer Drill

Model No. 17 Electromagnetic hammer drill, manufactured by Syntron Co., Homer City, Pa., is for high-speed hole drilling in concrete, brick and stone. It has a $1\frac{1}{8}$-inch drilling capacity, weighs $21\frac{1}{2}$ pounds and is available for operation from 110 v ac or 220 v ac. Automatic rotation of the carbide tipped, spiral-fluted drill speeds up hole drilling and eliminates manual turning of drill chuck.

Check No. 25 on Reply Card for more Details

High Speed Counter

Series 1370 counter, made by Veeder-Root Inc., Hartford 2, Conn., is rated at 1500 driveshaft rpm which gives 15,000 counts per minute with a standard 10-digit unit wheel. It is nonreset type, adding when the driveshaft is rotated in one direction and subtracting when rotated in the opposite direction. It can be made in any figure capacity.

Check No. 26 on Reply Card for more Details

Noninflammable Hydraulic Fluid

H-2 noninflammable hydraulic fluid, available from R. M. Hollingshead Corp., Camden 2, N. J., will not and cannot burn and, therefore, will eliminate fire hazards now associated with many industrial hydraulic systems and hydraulically operated machines.

Check No. 27 on Reply Card for more Details

Selenium Rectifiers

A new line of hermetically sealed selenium cartridges has been developed by International Rectifier Corp., Los Angeles 43, Calif. They are assembled in half wave cartridges with current ratings from 300 microamperes up to 60 milliamperes. They can be operated in ambient temperatures up to 100° C. Outside diameters vary from $\frac{1}{4}$ up to $1\frac{1}{4}$ inches, depending upon current rating.

Check No. 28 on Reply Card for more Details

Rotary Pressure Joints

Johnson Corp., Three Rivers, Mich., announces self-supporting type S joints are now available in heavy duty construction suitable for operating pressures up to 250 pounds. They are available for through flow or syphon pipe service; the through-flow type serves for inlet at one end of the roll with outlet at other end and syphon pipe type for inlet and outlet through the same joint.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

74. Conveyor Roll Bearings

Aguto Oilless Bearing Co.—Technical data sheet 200 sets forth range of standard sizes and characteristics of wood self-lubricating conveyor roll bearings for use with driven, belt or gravity conveyors. Diagrams show design and installation directions for new or old installations.

75. Metal Tubing

Nikoh Tube Co.—32-page booklet entitled "Nikoh Quality Tube" presents a pictorial story of various operations in production of electric weld steel tubing and conduit. Tabulated data on sizes and tolerances of round and square tubing is featured.

76. Surface Inspection

Brush Development Co.—"Surface Evaluation by Faxfilm" is title of 8-page folder explaining applications and equipment for Faxfilm, a process employing a plastic replica to show roughness, wear, grain and other surface conditions of variety of materials. Applications for inspection and for test and process engineering are outlined.

77. Turbine Pumps

Ingersoll - Rand Co.—8 - page illustrated catalog No. 7228 contains complete technical data on class APH-APK line of vertical, turbine - type pumps applicable to bulk liquid transfer, cooling tower, dewatering and other services where suction is taken from an open source.

78. Abrasive Specialties

Behr-Manning Corp. — "Blueprints for Faster, Better Production" is series of six 4-page illustrated bulletins which deal with coated abrasive specialties and solid abrasive oil stone specialties for use in the metals finishing fields. They are contained in folding cover that can be expanded into permanent wall chart which describes available abrasive specialties and suggests applications for them.

79. Cutting Oils

Sun Oil Co.—Factual data concerning more than 50 typical metalworking jobs is presented in 80-page illustrated booklet, "Cutting & Grinding Facts." It contains descriptions of straight and emulsifiable cutting oils, and shop man's chart showing correct fluids for most frequently used metals and metalworking machines.

80. Metal-Cutting Saws

Peerless Machine Co.—8-page illustrated bulletin 52-A has detailed description of features, advantages and specifications of Peerless standard metal-cutting saws with coolant systems. Three sizes have 6 x 6 in., 9 x 9 in. and 13 x 16 in. capacities.

81. Furnace Refractories

Carborundum Co., Refractories Div. —20-page illustrated manual No. 5120 deals with line of Super refractories which includes Carborundum, Carbofax, Alfrax, Mulfrax and Monofrax types. Guidance is offered for selection and application of correct refractory for given service conditions. Such factors as heat resistance, insulation, heat retention, chemical resistance, abrasion resistance and shapes are discussed.

82. Aluminum Castings

Aluminum Industries, Inc. — Described and illustrated in 4-page bulletin 20-A are company's facilities for producing and finishing aluminum alloy castings. X-ray and other flaw detection equipment is shown.

83. Boring & Turning Mill

Baldwin-Lima-Hamilton Corp. — Modernized Niles 42-in. vertical boring and turning mill with side head is subject of 4-page bulletin No. 71551. New design features incorporated in machine, as well as other features and specifications, are covered.

84. Rust Preventive

Nox-Rust Chemical Corp.—Wall chart No. 451 measuring 17 x 22 in. lists uses, minimum protection time, application and removal, physical description and miscellaneous data on various Nox-Rust protective coatings for metal parts and machinery. Preservatives meeting various Federal and military specifications are presented.

85. Presses

Colonial Broach Co.—4-page illustrated bulletin VBS-51 gives working capacities and plan drawing with installation dimensions of improved line of Utility 4 to 10-ton presses. Applications and description of pressed and accessories are included.

86. Cutter & Tool Grinder

Cincinnati Milling Machine Co.—Complete illustrations and description of No. 2 cutter and tool grinder plus all standard and extra attachments for these machines can be found in 40-page catalog No. M-1734. Pictures show practically every application possible with these grinders.

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HELPFUL LITERATURE

87. Power Transmission Drive

Morse Chain Co.—16-page illustrated catalog No. C 72-51 describes and illustrates features and advantages of Morse HY-VO power transmission drive. Principle which practically eliminates chordal action is covered, as are speeds, capacities, installation, adjustment and lubrication.

88. Revolving Cranes

American Hoist & Derrick Co.—20-page illustrated catalog No. 400-R-3 depicts specialized and standard applications of American Revolver cranes in hook, magnet and clamshell operations for industrial materials handling. Rated lifting capacities of various models range from 50,000 lb at 25-ft radius to 30,000 lb at 150-ft radius.

89. Hydraulic Presses

Denison Engineering Co.—8-page illustrated "Dension Press" explains use of HydrOILic presses for trimming, riveting, assembling, broaching, swaging, testing, crimping, staking and stamping operations. Case studies of typical production operations are cited, and data are included on presses and accessories.

90. Aluminum Extrusions

Reynolds Metals Co. — 137-page ring-bound booklet "Designing with Aluminum Extrusions" presents photos, dimensional and cross-sectional drawings and technical information on many designs and applications of aluminum extrusions. A section of tables gives added data about mechanical, chemical and physical properties, fabricating ratings, thicknesses and lengths, dimensional tolerances, joining methods and finishes.

91. Tube Bending

Tube Bends Inc.—8-page illustrated brochure No. 516 shows expanded facilities of company engaged in design and production of specialized tubular parts for aircraft and allied industries.

92. Nitrogen Generator

Minneapolis-Honeywell Regulator Co., Brown Instruments Div.—Instrumentation data sheet 4.4-4 describes Nitroneal generator made by Baker & Co., Newark, N. J., which, with its Brown ElectroniK potentiometer, provides automatic generator for producing gaseous output free of oxygen and suitable for metal treating and various chemical operations.

93. Surface Hardener

Eutectic Welding Alloys Corp.—How Eutectic Instant Hardener for emergency surface hardening of steel tools, parts, threads and dies is used with ordinary welding torch is explained in 6-page illustrated folder No. 512P.

94. Laminated Phenolic

Richardson Co.—Features, applications, electrical and physical characteristics and characteristic properties of Insurok grade T-725 paper base laminated phenolic are included in data sheet 20.725.1. It has electrical properties applicable to radio frequency circuits.

95. Tachometer Indicators

Metron Instrument Co.—Developed for measuring speeds of two to ten machines with single fixed indicator, series 42R tachometer indicators are described in data sheet No. 42R. Rotation of head knob selects machine to be monitored. Any of 51 standard full scale range markings are available.

96. Drawn Shell Trimmer

Dayton Rogers Mfg. Co.—How the universal drawn shell trimmer is used for mass production or short runs involving trimming, beading, knurling and forming of square, round, rectangular and irregular shells is described in 4-page illustrated bulletin F-25A.

97. Conveyor Ball Bearings

General Motors Corp., New Departure Div.—Various types of conveyor bearings with effective seals are described and illustrated in 16-page booklet A-26 "Lubricated-for-Life Ball Bearings for Conveyor Systems". Types for various installations, detailed drawings and specifications are given.

98. Steam Purifiers

V. D. Anderson Co.—Details of new Hi-eF purifiers for installation inside steam drums, evaporators, packed towers, deodorizers and stills are given in 4-page illustrated bulletin 100. Unit delivers vapor with 1 part per million or less of total solids.

99. Electric Motors

Howell Electric Motors Co.—Illustrated folder entitled "3 Points to Help You" answers three questions about design, quality and service of line of industrial type alternating current motors. Available in standard NEMA frame sizes, motors range from 1/6 to 150 hp.

100. Industrial Fork Trucks

Baker-Raulang Co., Baker Industrial Truck Div.—8-page illustrated bulletin No. 1326 lists specifications of type PC fork trucks which are available in capacities of 3000, 4000 and 6000 lb. Design features of these electric industrial trucks are shown.

FOR MORE INFORMATION USE ONE OF THESE CARDS . .

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7	27	47	67	87
8	28	48	68	88
9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
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STEEL 9-3-51

Penton Building, Cleveland 13, Ohio

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Major Class—Metal Forming—Cold

Sub-Group — Special Purpose

Tool Characteristics—Wear Resistance

Tool Steel—Airdi 150

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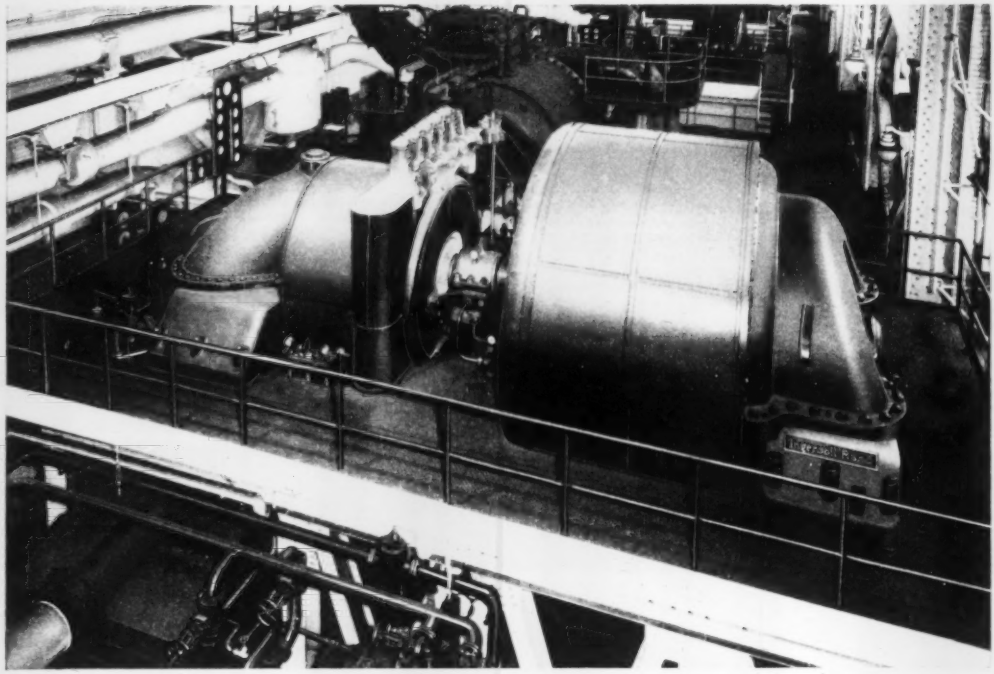

Here's why Ford Motor Co. uses Ingersoll-Rand Turbo-Blowers

This Ingersoll-Rand Turbo-Blower went on line January 17, 1949 and, because of the national emergency, has been running continuously since. As of today (6-15-51) it has been running 24 hours a day for 879 days. This is a good record but not unusual for I-R blowers. They're built to stay on line.

It serves #3 Blast Furnace at the Ford Motor Co.'s Rouge Plant, Dearborn, Michigan. The unit is rated 100,000 cfm and 30 psig. It is driven by an I-R 11,150 hp steam turbine which is served by an Ingersoll-Rand surface condenser containing 4700 sq ft of condensing surface. The condenser is served by Ingersoll-Rand air ejectors, condensate and circulating water pumps.

Once started a Blast Furnace should never be shut down until it needs relining. And to keep it "alive," air must be supplied continuously—night and day, month after month.

Blast Furnace operators know they can't afford to take any chances on the dependability of their blowing equipment. It is significant that Ingersoll-Rand has more than 1,500,000 horsepower of heavy-duty Blast Furnace Turbo-Blowers in operation.

This unequalled experience in Turbo-Blower design and manufacture is your best assurance of maximum availability, plus minimum power and maintenance costs.

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The Market Outlook

PRESSURE for steel shows no signs of abating. Currently, steelmakers are being pressed increasingly by consumers to accept orders for shipment after the turn of the year. From some consuming directions the mills could book business into third quarter next year were they so disposed since various buyers have been given the green light by the National Production Authority to order that far ahead. Except for some high-rated military directives, however, the steelmakers are accepting no business for entry after Dec. 31 other than limited tonnages from regular customers, and these latter for first quarter delivery only.

FUTURE BOOKING—It is unlikely the mills will enter much tonnage for next year until fourth quarter scheduling is out of the way. Their reluctance to become booked far ahead is understandable in the circumstances, what with substantial CMP fourth quarter tonnage still uncovered. Actually, the steel producers are under no compulsion to accept distant shipment business, especially since the recent amendment to NPA order M-1 permits them to accept or reject tonnage orders up to 15 days prior to expiration of established lead-time for a scheduling period.

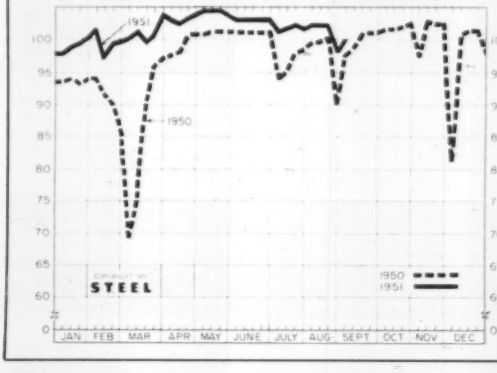
FOURTH QUARTER—Problems in scheduling are expected throughout fourth quarter. Amending of NPA order M-1, largely eliminating the first-come first-served basis for booking under CMP, will not have much effect before first quarter. Meanwhile, hopes that the muddle in scheduling would clear away before the closing quarter this year gets too far along have been jolted by resurgence of consumer complaints to NPA of inability to get position in fourth quarter rolling schedules for certified CMP tonnage. The flood of complaints to Washington indicates this "stranded" tonnage is substantial. Chances for placement of these uncovered orders appear limited to the extent cancellations come to the mills, and so far concellations have released relatively little tonnage. As things now stand, unplaced CMP tickets are still little more than "hunting licenses" so far as many buyers are concerned.

WAREHOUSE—Increase in the warehouse take of carbon steel production to 100 per cent of base period receipts, proposed in an amendment to NPA order M-6, now appears delayed until first quarter next year. Originally, the increase was proposed to become effective with fourth quarter. However, it is unlikely the steel distributors will get much relief tonnagewise over the remainder of the year. In fact, there is some question whether the increase in their tonnage take beginning first quarter will run as high as the 75,000 tons monthly now proposed.

PRICES—Important development pricewise in the steel markets last week is seen in an announcement of a change in structural steel shape prices by Phoenix Iron & Steel Co. This revision, approximately $26 per ton, becomes effective Sept. 1. After that date the company will price and invoice in terms of a single "base price" which will include additional charges heretofore separately stated, plus applicable standard extras. The change is based on an official interpretation by the Office of Price Stabilization in response to a company request for a specific ruling. Otherwise, the steel markets are unchanged except for increases in delivered prices to reflect the rise in freight rates effective Aug. 28. STEEL's weighted index on finished steel, based on mill quotations, is unchanged at 171.92, as is the arithmetical composite at $106.32.

PRODUCTION—Recovery of Buffalo district steelmaking operations from the effects of railroad labor trouble at that point lifted the estimated national ingot rate 2 points to 100 per cent of capacity. District rates jumped 76.5 points to 104 per cent in Buffalo, 5 points to 106 in Youngstown, 3 points to 92 in New England, and, from a revised rate for the preceding week, 1 point to 105 in Chicago.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Sept. 1		Same Week 1950	Same Week 1949
Pittsburgh	97.5	— 0.5*	101	80.5
Chicago	105	+ 1*	93.5	91
Mid-Atlantic	100.5	0	98.5	80
Youngstown	106	+ 5	106	94
Wheeling	97.5	— 1	97.5	96
Cleveland	101.5	— 3*	92	101.5
Buffalo	104	+76.5	104	101.5
Birmingham	100	0	100	100
New England	92	+ 3	65	77
Cincinnati	101	0	103	97
St. Louis	87	— 6	89	87
Detroit	106	0*	110	103
Western	102	— 3	102	85
Estimated national rate	100	+ 2	97.5	86

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 51 Production-Engineering News—p. 87

Composite Market Averages

	Aug. 30 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av. = 100)	171.92	171.92	171.92	156.99	112.04
Index in cents per lb.	4.657	4.657	4.657	4.253	3.035
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$94.50	$64.45
No. 2 Fdry. Pig Iron, GT	52.64	52.64	52.64	46.88	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	27.50
Malleable Pig Iron, GT	53.27	53.27	53.27	47.49	28.79
Steelmaking Scrap, GT	44.00	44.00	44.00	40.92	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Aug. 30 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.223	4.20	4.20	3.93	2.86
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10-15	3.10
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia	3.918	3.91	3.91	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.90	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.90	2.50
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.50	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.15-50	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-95	3.15
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.50	2.95
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.30	3.75
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, ⅜-⅝", Pitts.	4.10-30	4.10-30	4.10-30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.50	$29.00
Basic, Valley	52.00	52.00	52.00	46.00	28.00
Basic, del. Phila.	56.61	56.61	56.46	50.38	29.93
No. 2 Fdry., Pitts.	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry., Chicago	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry., Valley	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry., Del. Phila.	57.11	56.96	56.99	50.88	30.43
No. 2 Fdry., Birm.	48.38	48.38	48.38	42.38	24.88
No. 2 Fdry. Birm. del. Cin.	55.49	55.33	55.33	49.08	28.94
Malleable Valley	52.50	52.50	52.50	46.50	28.50
Malleable, Chicago	52.50	52.50	52.50	46.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$45.00	$45.00	$45.00	$41.00	$20.00
No. 1 Heavy Melt, E. Pa.	43.50	43.50	43.50	38.50	18.75
No. 1 Heavy Melt, Chicago	43.50	43.50	43.50	40.25	18.75
No. 1 Heavy Melt, Valley	45.00	43.00	45.00	43.75	20.00
No. 1 Heavy Melt, Cleve.	44.00	44.00	44.00	41.75	19.50
No. 1 Heavy Melt, Buffalo	44.00	44.00	44.00	39.75	19.25
Rails, Rerolling, Chicago	52.50	52.50	52.50	50.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.25	$8.75
Beehive, Fdry. Connlsvl.	17.50	17.50	17.50	15.50	9.75
Oven, Fdry., Chicago	23.00	23.00	23.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	22.50-24.50	14.375
Zinc, E. St. Louis	17.50	17.50	17.50	15.00	8.25
Lead, St. Louis	16.80	16.80	16.80	13.80	8.10
Tin, New York	103.00	103.00	103.00	98.50	52.00
Aluminum, del.	19.00	19.00	19.00	17.50	15.00
Antimony, Laredo, Tex.	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid	56.50	56.50	56.50	48.00	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3%-federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham, R2	48.38	48.88	....	....
Birmingham, S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo, R2	52.00	52.50	53.00	....
Buffalo, H1	52.00	52.50	53.00	....
Tonawanda, N.Y., W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y., T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.38*	55.38*	55.88*	....
Syracuse, N.Y., del.	55.91*	56.41*	56.91*	....
Chicago District				
Chicago, I-3	52.00	52.50	52.50	53.00
Gary, Ind., U5	52.00	....	52.50	....
Indiana Harbor, Ind., I-2	52.00	....	52.50	....
So. Chicago, Ill., W14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill., U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland, A7	52.00	52.50	52.50	53.00
Cleveland, R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.49	54.99	54.99	55.49
Lorain, O., N3	52.00	....	....	53.00
Duluth, I-3	....	....	52.50	....
Erie, Pa., I-3	52.00	52.50	52.50	53.00
Everett, Mass., E1	....	55.25	55.75	....
Fontana, Calif., K1	58.00	58.50	....	....
Geneva, Utah, G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del.	60.16	60.66	....	....
Granite City, Ill., G4	53.50	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah, C11	52.00	52.50	....	....
Lone Star, Tex., L6	48.00	*48.50	48.50	....
Minnequa, Colo., C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa., P6	....	52.50	52.50	53.00
Pitts., N. & S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa., U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa., U5	52.00	....	....	....
McKeesport, Pa., N3	52.00	....	....	53.00
Monessen, Pa., P7	54.00	....	....	....
Sharpsville, Pa., S6	....	....	52.50	53.00
Steelton, Pa., B2	54.00	54.50	55.00	55.50
Swedeland, Pa., A3	56.00	56.50	57.00	57.50
Toledo, O., I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.21	57.71	....	....
Troy, N.Y., R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O., Y1	52.00	52.50	52.50	....
Youngstown, Y1	52.00	52.50	52.50	....
Youngstown, U5	52.00	....	....	53.00
Mansfield, O., del.	56.43	56.93	56.93	57.43

* Low phos. southern grade. ** Preliminary.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O., G2, J1	$62.50
Buffalo, H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y., P15	$88.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, Oil & Fdry., 12% lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard-chilling iron Nos. 5 & 6)

Lyles, Tenn., T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa., B2	60.00
Philadelphia, delivered	63.37
Troy, N.Y., R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Aug. 30, 1951; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $79.00
Munhall,Pa. U5 ... 52.00

INGOTS, Alloy (NT)
Detroit R7 ... $54.00
Fontana,Calif. K1 ... 80.00
Houston,Tex. S5 ... 62.00
Midland,Pa. C18 ... 54.00
Munhall,Pa. U5 ... 54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $56.00
Clairton,Pa. U5 ... 56.00
Ensley,Ala. T2 ... 56.00
Fairfield,Ala. T2 ... 56.00
Fontana,Calif. K1 ... 75.00
Gary,Ind. U5 ... 56.00
Johnstown,Pa. B2 ... 56.00
Lackawanna,N.Y. B2 ... 56.00
Munhall,Pa. U5 ... 56.00
So.Chicago,Ill. U5 ... 56.00
So.Duquesne,Pa. U5 ... 56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $66.00
Buffalo R2 ... 66.00
Canton,O. R2 ... 66.00
Clairton,Pa. U5 ... 66.00
Cleveland R2 ... 66.00
Conshohocken,Pa. A3 ... 73.00
Detroit R7 ... 69.00
Ensley,Ala. T2 ... 66.00
Fairfield,Ala. T2 ... 66.00
Fontana,Calif. K1 ... 85.00
Gary,Ind. U5 ... 66.00
Geneva,Utah G1 ... 66.00
Houston,Tex. S5 ... 74.00
Johnstown,Pa. B2 ... 66.00
Lackawanna,N.Y. B2 ... 66.00
LosAngeles B3 ... 85.00
Munhall,Pa. U5 ... 66.00
Seattle B3 ... 85.00
So.Chicago R2,U5,W14 ... 66.00
So.Duquesne,Pa. U5 ... 66.00
So.SanFrancisco B3 ... 85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $70.00
Buffalo R2 ... 70.00
Canton,O. R2 ... 70.00
Canton,O.(29) T7 ... 66.00
Conshohocken,Pa. A3 ... 77.00
Detroit R7 ... 73.00
Fontana,Calif. K1 ... 85.00
Gary,Ind. U5 ... 70.00
Houston,Tex. S5 ... 78.00
Ind.Harbor,Ind. Y1 ... 70.00
Johnstown,Pa. B2 ... 70.00
Lackawanna,N.Y. B2 ... 70.00
LosAngeles B3 ... 90.00
Massillon,O. R2 ... 70.00
Midland,Pa. C18 ... 70.00
Munhall,Pa. U5 ... 70.00
So.Chicago R2,U5,W14 ... 70.00
So.Duquesne,Pa. U5 ... 70.00
Struthers,O. Y1 ... 70.00
Warren,O. C17 ... 70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ... $82.00
Cleveland R2 ... 82.00
Fontana,Calif. K1 ... 105.00
Gary,Ind. U5 ... 82.00
Massillon,O. R2 ... 82.00
So.Chicago,Ill. R2 ... 82.00
So.Duquesne,Pa. U5 ... 82.00

SHEET BARS (NT)
Fontana,Calif. K1 ... $80.00

SKELP
Aliquippa,Pa. J5 ... $3.45
Munhall,Pa. U5 ... 3.35
Warren,O. R2 ... 3.35
Youngstown, R2, U5 ... 3.35

WIRE RODS
Alton,Ill. L1 ... 4.10
AlabamaCity,Ala. R2 ... 4.10
Buffalo W12 ... 4.10
Cleveland A7 ... 4.10
Donora,Pa. A7 ... 4.10
Fairfield,Ala. T2 ... 4.10
Fontana,Calif. K1 ... 4.90
Houston,Tex. S5 ... 4.50
Johnstown,Pa. B2 ... 4.10
Joliet,Ill. A7 ... 4.10
LosAngeles B3 ... 4.90
Minnequa,Colo. C10 ... 4.35
Monessen,Pa. P7 ... 4.30
No.Tonawanda,N.Y. B11 ... 4.10
Pittsburg,Calif. C11 ... 4.75
Portsmouth,O. P12 ... 4.30
Roebling,N.J. R5 ... 4.20
So. Chicago,Ill. R2 ... 4.10
SparrowsPoint,Md. B2 ... 4.20
Sterling,Ill.(1) N15 ... 4.10
Struthers,O. Y1 ... 4.10
Torrance,Calif. C11 ... 4.90
Worcester,Mass. A7 ... 4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.45
Lackawanna,N.Y. B2 ... 4.45
Munhall,Pa. U5 ... 4.45
So.Chicago,Ill. U5 ... 4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.60
Aliquippa,Pa. J5 ... 3.65
Bessemer,Ala. T2 ... 3.65
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fairfield,Ala. T2 ... 3.65
Fontana,Calif. K1 ... 4.25
Gary,Ind. U5 ... 3.65
Geneva,Utah G1 ... 3.65
Houston,Tex. S5 ... 4.05
Ind.Harbor,Ind. I-2 ... 3.65
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.25
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.25
Minnequa,Colo. C10 ... 4.10
Munhall,Pa. U5 ... 3.65
Niles,Calif.(22) P1 ... 4.85
Phoenixville,Pa. P4 ... 4.95
Portland,Oreg. O4 ... 4.50
Seattle B3 ... 4.30
So.Chicago,Ill. U5, W14 ... 3.65
So.SanFrancisco B3 ... 4.20
Torrance,Calif. C11 ... 4.25
Weirton,W.Va. W6 ... 3.90

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.35
Fontana,Calif. K1 ... 5.55
Munhall,Pa. U5 ... 4.35
So.Chicago,Ill. U5 ... 4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.50
Bessemer,Ala. T2 ... 5.50
Bethlehem,Pa.(14) B2 ... 5.50
Clairton,Pa. U5 ... 5.50
Fairfield,Ala. T2 ... 5.50
Fontana, Calif. K1 ... 6.10
Gary,Ind. U5 ... 5.50
Geneva,Utah G1 ... 5.50
Ind.Harbor,Ind. I-2 ... 5.50
Ind.Harbor,Ind. Y1 ... 6.00
Johnstown,Pa. B2 ... 5.50
Lackawanna,N.Y.(14) B2 ... 5.50
LosAngeles B3 ... 6.05
Munhall,Pa. U5 ... 5.50
Seattle B3 ... 6.10
So.Chicago,Ill. U5 ... 5.50
So.SanFrancisco B3 ... 6.00
Struthers,O. Y1 ... 6.00

Wide Flange
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fontana,Calif. K1 ... 4.65
Lackawanna,N.Y. B2 ... 3.70
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ... 5.50
Lackawanna,N.Y. B2 ... 5.50
Munhall,Pa. U5 ... 5.45
So.Chicago,Ill. U5 ... 5.45

BEARING PILES
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.65
Bessemer,Ala. T2 ... 5.65
Clairton,Pa. U5 ... 5.65
Cleveland J5, R2 ... 5.65
Conshohocken,Pa. A3 ... 5.90
Fairfield,Ala. T2 ... 5.65
Fontana,Calif.(30) K1 ... 6.25
Gary,Ind. U5 ... 5.65
Geneva,Utah G1 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.65
Ind.Harbor,Ind. Y1 ... 6.15
Johnstown,Pa. B2 ... 5.65
Munhall,Pa. U5 ... 5.65
Pittsburgh J5 ... 5.65
Seattle B3 ... 6.55
Sharon,Pa. S3 ... 5.70
So.Chicago,Ill. U5 ... 5.65
SparrowsPoint,Md. B2 ... 5.65
Warren,O. R2 ... 5.65
Youngstown, Y1 ... 6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 4.85
Coatesville,Pa. L7 ... 5.25
Conshohocken,Pa. A3 ... 5.65
Fontana,Calif. K1 ... 5.70
Gary,Ind. U5 ... 4.75
Johnstown,Pa. B2 ... 4.75
Munhall,Pa. U5 ... 4.75
Sharon,Pa. S3 ... 5.20
So.Chicago,Ill. U5 ... 4.75
SparrowsPoint,Md. B2 ... 4.75

FLOOR PLATES
Cleveland J5 ... 4.75
Conshohocken,Pa. A3 ... 4.75
Harrisburg,Pa. C5 ... 5.95
Ind.Harbor, Ind. I-2 ... 4.75
Munhall,Pa. U5 ... 4.75
So.Chicago, Ill. U5 ... 4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ... 3.95
Ashland,l.c.l.(15) A10 ... 4.45
Cleveland,c.l. R2 ... 4.30
Warren,O.,c.l. R2 ... 4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Ashland,Ky.(15) A10 ... 3.70
Bessemer,Ala. T2 ... 3.70
Clairton,Pa. U5 ... 3.70
Claymont,Del. C22 ... 4.15
Cleveland J5, R2 ... 3.70
Coatesville,Pa. L7 ... 4.15
Conshohocken,Pa. A3 ... 4.15
Fairfield,Ala. T2 ... 3.70
Fontana,Calif.(30) K1 ... 4.30
Gary,Ind. U5 ... 3.70
GraniteCity,Ill. G4 ... 4.40
Geneva,Utah, G1 ... 3.70
Harrisburg,Pa. C5 ... 4.95
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Minnequa,Colo. C10 ... 4.00
Munhall,Pa. U5 ... 3.70
Pittsburgh J5 ... 3.70
Seattle B3 ... 4.60
Sharon,Pa. S3 ... 3.95
So.Chicago,Ill. U5, W14 ... 3.70
SparrowsPoint,Md. B2 ... 3.70
Steubenville,O. W10 ... 3.70
Warren,O. R2 ... 3.70
Weirton,W.Va. W6 ... 4.00
Youngstown R2, U5, Y1 ... 3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ... 5.45
Geneva,Utah G1 ... 4.85

PLATES, Wrought Iron
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Ambridge,Pa. A14 ... 3.70
Atlanta,Ga. A11 ... 4.25
Bessemer,Ala. T2 ... 3.70
Buffalo R2 ... 3.70
Canton,O. R2 ... 3.70
Clairton,Pa. U5 ... 3.70
Cleveland R2 ... 3.70
Detroit R7 ... 3.85
Emeryville,Calif. J7 ... 4.15
Fairfield,Ala. T2 ... 3.70
Fontana, Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity, Mo. S5 ... 4.30
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.20
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.65
N.Tonawanda,N.Y. B11 ... 3.70
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.65
Seattle B3 ... 4.45
So.Chicago R2,U5,W14 ... 3.70
So.Duquesne,Pa. U5 ... 3.70
So.SanFran.,Cal. B3 ... 4.45
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Weirton,W.Va. W6 ... 3.85
Youngstown R2, U5 ... 3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ... 3.70
Atlanta, A11 ... 4.25
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Niles,Calif. P1 ... 5.05
Portland,Oreg. O4 ... 4.65
SanFrancisco S7 ... 4.85

BAR SIZE ANGLES,H.R. CARBON
Bethlehem,Pa. B2 ... 3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.30
Buffalo R2 ... 4.30
Canton,O. R2 ... 4.30
Canton,O.(29) T7 ... 3.95
Clairton,Pa. U5 ... 4.30
Detroit R7 ... 4.45
Ecorse,Mich. G5 ... 4.65
Fontana,Calif. K1 ... 5.35
Gary,Ind. U5 ... 4.30
Houston,Tex. S5 ... 4.70
Ind.Harbor,Ind. I-2, Y1 ... 4.30
Johnstown,Pa. B2 ... 4.30
KansasCity,Mo. S5 ... 4.90
Lackawanna,N.Y. B2 ... 4.30
LosAngeles B3 ... 5.35
Massillon,O. R2 ... 4.30
Midland,Pa. C18 ... 4.30
So.Chicago R2,U5,W14 ... 4.30
So.Duquesne,Pa. U5 ... 4.30
Struthers,O. Y1 ... 4.30
Warren,O. C17 ... 4.30
Youngstown U5 ... 4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.55
Gary, Ind. U5 ... 4.55
Youngstown U5 ... 4.55

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.55
Bessemer,Ala. T2 ... 5.55
Bethlehem,Pa. B2 ... 5.55
Clairton,Pa. U5 ... 5.55
Cleveland R2 ... 5.55
Fairfield,Ala. T2 ... 5.55
Fontana,Calif. K1 ... 6.60
Gary,Ind. U5 ... 5.55
Ind.Harbor,Ind. I-2 ... 5.55
IndianaHarbor,Ind. Y1 ... 6.05
Johnstown,Pa. B2 ... 5.55
Lackawanna,N.Y. B2 ... 5.55
LosAngeles B3 ... 6.25
Niles,Calif. P1 ... 6.55
Pittsburg,Calif. C11 ... 6.40
Pittsburgh J5 ... 5.55
Seattle B3 ... 6.30
So.Duquesne,Pa. U5 ... 5.55
So.SanFrancisco B3 ... 6.30
Struthers, O. Y1 ... 6.05
Youngstown U5 ... 5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.55
BeaverFalls,Pa. M12,R2 ... 4.55
Buffalo B5 ... 4.60
Camden,N.J. P13 ... 5.00
Carnegie,Pa. C12 ... 4.55
Chicago W18 ... 4.55
Cleveland A7, C20 ... 4.55
Detroit P17 ... 4.70
Donora,Pa. A7 ... 4.55
Elyria,O. W8 ... 4.55
FranklinPark,Ill. N5 ... 4.55
Gary,Ind. R2 ... 4.55
GreenBay, Wis. F7 ... 4.55
Hammond,Ind. I-2, M13 ... 4.55
Hartford,Conn. R2 ... 5.10
Harvey,Ill. B5 ... 4.55
LosAngeles R2 ... 6.00
Mansfield,Mass. B5 ... 5.10
Massillon,O. R2, R8 ... 4.55
Monaca, Pa. S17 ... 4.55
Newark,N.J. W18 ... 5.00
Newark,N.J. W18 ... 5.00
Plymouth,Mich. P5 ... 4.80
Pittsburgh J5 ... 4.55
Putnam,Conn. W18 ... 5.10
Readville,Mass. C14 ... 5.10
St. Louis,Mo. M5 ... 4.95
So.Chicago,Ill. W14 ... 4.55
SpringCity,Pa. (5) K3 ... 5.00
Struthers,O. Y1 ... 4.55
Waukegan,Ill. A7 ... 4.55
Youngstown F3, Y1 ... 4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 5.40
BeaverFalls,Pa. M12 ... 5.40
Bethlehem,Pa. B2 ... 5.40
Buffalo B5 ... 5.40
Camden,N.J. P13 ... 5.80
Canton,O. R2 ... 5.40
Canton,O.(29) T7 ... 4.90
Carnegie,Pa. C12 ... 5.40
Chicago W18 ... 5.40
Cleveland A7 ... 5.45
Cleveland C20 ... 5.40
Detroit P17 ... 5.55
Donora,Pa. A7 ... 5.45
Elyria,O. W8 ... 5.40
Gary,Ind. R2 ... 5.40
Hammond,Ind. I-2, M13 ... 5.40
Hartford,Conn. R2 ... 5.85
Harvey,Ill B5 ... 5.40
Lackawanna,N.Y. B2 ... 5.40
Mansfield,Mass. B5 ... 5.85
Massillon,O. R2,R8 ... 5.40
Midland,Pa. C18 ... 5.40
Monaca,Pa. S17 ... 5.40
Newark,N.J. W18 ... 5.75
Plymouth,Mich. P5 ... 5.60
So.Chicago,Ill. R2, W14 ... 5.40
Struthers,O. Y1 ... 5.40
Warren,O. C17 ... 5.40
Waukegan,Ill. A7 ... 5.45
Worcester,Mass. A7 ... 5.75
Youngstown F3, Y1 ... 5.40

RAIL STEEL BARS
Chicagolits.(3,4) C2 ... 4.75
Chicagolits(3,4) I-2 ... 4.50
Franklin,Pa.(3,4) F5 ... 4.75
FortWorth,Tex.(26) T4 ... 4.85
Huntngtn,W.Va.(3) W7 ... 5.50
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 5.80
Tonawanda (3,4) B12 ... 4.75
Williamsport(3) S19 ... 5.00
Williamsport(4) S19 ... 5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 ... 15.00
Dover,(Eng.Bolt) U1 ... 13.50
Dover&Wrgt.Iron) U1 ... 12.25
Economy,Pa.(S.R.) B14 ... 9.60
Economy,Pa.(D.R.)B14 ... 11.90
Economy,(Staybolt)B14 ... 12.20
McK.Rks.(Staybolt) L5 ... 14.50
McK.Rks.(S.R.) L5 ... 9.60
McK.Rks.(D.R.) L5 ... 13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.70
Atlanta A11 ... 4.25
Buffalo R2 ... 3.70
Cleveland R2 ... 3.70
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.30
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.20
Minnequa,Colo. C10 ... 4.00
Monaca,Pa. S17 ... 4.55
Niles,Calif. P1 ... 5.65
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portsmouth,O. P12 ... 4.30
Seattle B3 ... 4.60
Sharon,Pa. S3 ... 3.95
So.Chicago,Ill. U5 ... 3.70
So.SanFrancisco B3 ... 4.60
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Williamsport S19 ... 5.00
Youngstown R2, U5 ... 3.70

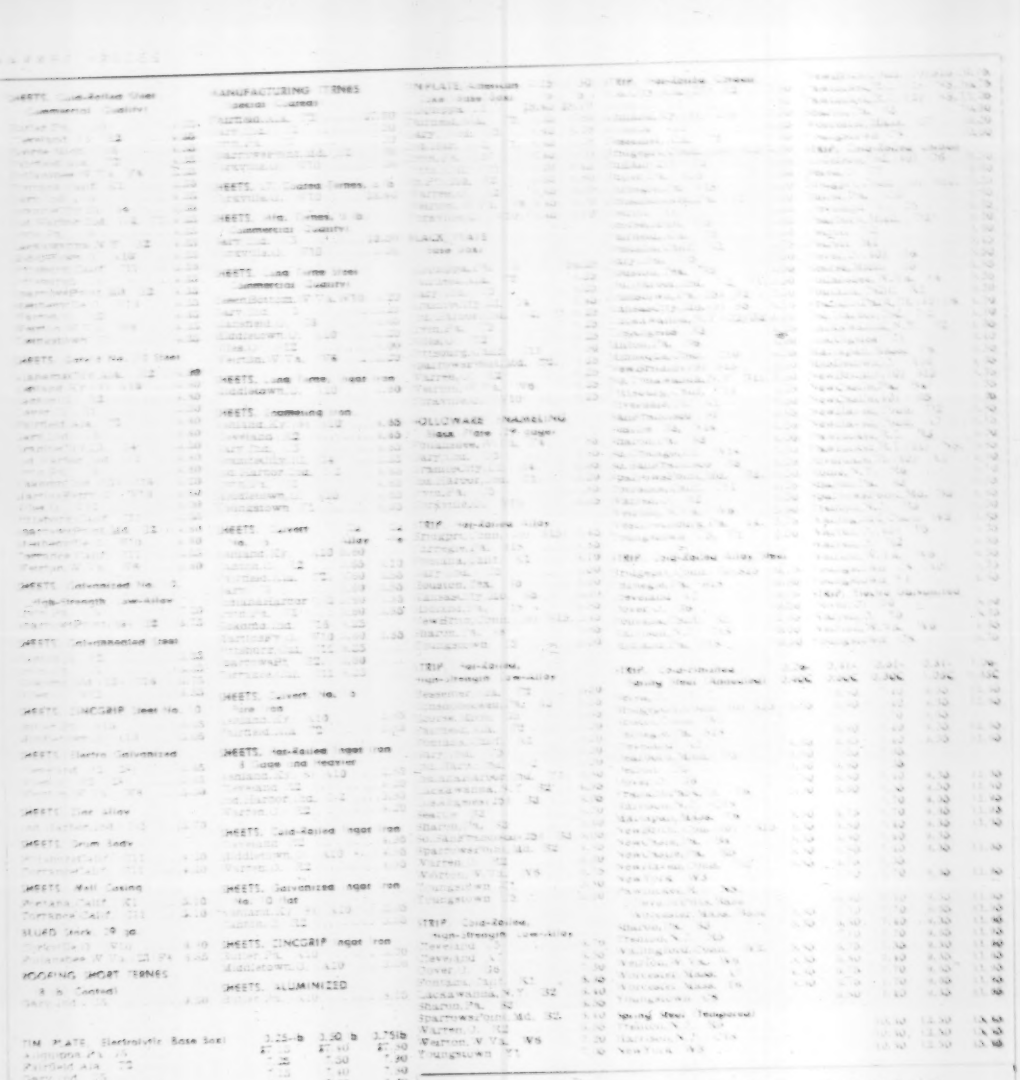
BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ... 5.50
Johnstown, 1/2-1" B2 ... 4.75
LosAngeles B3 ... 5.45
Marion,O. P11 ... 5.00
Seattle B3, N14 ... 5.55
So.SanFrancisco B3 ... 5.45
SparrowsPt. 1/2-1" B2 ... 4.75
Williamsport,Pa. S19 ... 5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.60
Ashland,Ky.(8) A10 ... 3.60
Butler,Pa. A10 ... 3.60
Cleveland J5, R2 ... 3.60
Conshohocken,Pa. A3 ... 4.00
Detroit M1 ... 4.40
Ecorse,Mich.(8) G5 ... 3.80
Fairfield,Ala. T2 ... 3.60
Fontana,Calif. K1 ... 4.55
Gary,Ind. U5 ... 3.60
Geneva,Utah G1 ... 3.70
GraniteCity,Ill. G4 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.60
Irvin,Pa. U5 ... 3.60
Lackawanna,N.Y. B2 ... 3.60
Munhall,Pa. U5 ... 3.60
Niles,O. N12 ... 5.25
Pittsburg,Calif. C11 ... 4.30
Pittsburgh J5 ... 3.70
Sharon,Pa. S3 ... 4.00
So.Chicago,Ill. W14 ... 3.60
SparrowsPoint,Md. B2 ... 3.60
Steubenville,O. W10 ... 3.60
Torrance,Calif. C11 ... 4.30
Warren,O. R2 ... 3.60
Weirton,W.Va. W6 ... 3.60
WestLeechburg,Pa. A4 ... 4.75
Youngstown U5, Y1 ... 3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ... 4.75
Dover,O. R1 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.40
Mansfield,O. B6 ... 5.65
Niles,O. N12 ... 5.75
Torrance,Calif. C11 ... 5.40

SHEETS, H.R. (14-ga., heaviest)
High-Strength Low-Alloy
Cleveland J5, R2 ... 5.40
Conshohocken,Pa. A3 ... 5.65
Ecorse,Mich. G5 ... 5.95
Fairfield,Ala. T2 ... 5.40
Fontana,Calif. K1 ... 6.35
Gary,Ind. U5 ... 5.40
Ind.Harbor,Ind. I-2 ... 5.40
IndianaHarbor,Ind. Y1 ... 5.90
Irvin,Pa. U5 ... 5.40
Lackawanna(35) B2 ... 5.40
Pittsburgh J5 ... 5.40
Sharon,Pa. S3 ... 5.40
So.Chicago,Ill. U5 ... 5.40
SparrowsPoint(36) B2 ... 5.40
Warren,O. R2 ... 5.40
Weirton,W.Va. W6 ... 5.75
Youngstown U5 ... 5.75
Youngstown Y1 ... 5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.55
Ecorse,Mich. G5 ... 7.10
Fontana,Calif. K1 ... 7.50
Gary,Ind. U5 ... 6.55
IndianaHarbor,Ind. Y1 ... 7.05
IndianaHarbor,Ind. I-2 ... 6.55
Irvin,Pa. U5 ... 6.55
Lackawanna(37) B2 ... 6.55
Pittsburgh J5 ... 6.55
SparrowsPoint(38) B2 ... 6.55
Warren,O. R2 ... 6.55
Weirton,W.Va. W6 ... 6.90
Youngstown Y1 ... 7.05



TIN PLATE, Electrolytic Base Box	1.25-lb	1.50 lb	1.75lb
Aliquippa, Pa., J5	AT	AT	AT
Fairless, Pa., U5	+ .30	+ .50	+ .70
Gary, Ind., U5	+ .30	+ .50	+ .70
Granite City, Ill., G4	+ .30	+ .50	+ .70
Indiana Harbor, Ind., I2	+ .30	+ .50	+ .70
Irvin, Pa., U5	+ .30	+ .50	+ .70
Niles, O., R2	+ .30	+ .50	+ .70
Pittsburg, Calif., P11	+ .30	+ .50	+ .70
Sparrows Point, Md., B2	+ .30	+ .50	+ .70
Weirton, W. Va., W5	+ .30	+ .50	+ .70
Zanesville, O., A10	+ .30	+ .50	+ .70

SHEETS, SILICON (H.R. or C.R. 22 Ga.) COILS Cut Lengths (Vic lower)	Field	Armature	Electric	Motor	Dynamo
Beech Bottom, W10 (cut lengths)			7.25	8.50	9.30
Brackenridge, Pa., A4			7.75	9.00	9.80
Granite City, Ill., G4 (cut lengths)			7.95	9.20	
Ind. Harbor, Ind., I2	6.95	7.25	7.75		
Mansfield, O., BA (cut lengths)	7.19	7.25	7.75	9.00	9.80
Niles, O., N12 (cut lengths)		6.75	7.25		
Vandergrift, Pa., U5		7.25	7.75	9.00	9.80
Warren, O., R2	6.95	7.25	7.75	9.00	9.80
Zanesville, O., A10		7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths Vic lower) Transformer Grade	72	65	58	52
Beech Bottom, W10 (cut lengths)	9.40	10.40	11.10	11.90
Brackenridge, Pa., A4	10.35	....	....	....
Vandergrift, Pa., U5	10.35	10.90	11.60	12.40
Warren, O., R2	10.35	....	....	....
Zanesville, O., A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler, Pa., A10 (C.R.)	....	....	14.75	15.25
Vandergrift, Pa., U5	12.90	13.75	14.75	15.25

Key to Producers

A1	Acme Steel Co.	C10	Colorado Fuel & Iron
A2	Alan Wood Steel Co.	C11	Columbia Steel Co.
A3	Allegheny Ludlum Steel	C12	Columbia Steel & Shaft
A4	American Steel & Wire	C13	Columbia Tool Steel Co.
A5	American Tinning & Galv.	C14	Compressed Steel Shaft
A6	Anchor Drawn Steel Co.	C15	Continental Steel Corp.
A7	Angel Nail & Chaplet	C16	Copperweld Steel Co.
A8	Apollo Steel Co.	C17	Crucible Steel Co.
A9	Armco Steel Corp.	C18	Cumberland Steel Co.
A10	Atlantic Steel Co.	C19	Cuyahoga Steel & Wire
A11	American Chain & Cable Co.	C20	Cyclops Steel Corp.
A12	American Cladmetals Co.	C22	Cincinnati Steel Corp.
B1	Babcock & Wilcox Tube	D2	Detroit Steel Corp.
B2	Bethlehem Steel Co.	D3	Detroit Tube & Steel
B3	Beth. Pac. Coast Steel	D4	Disston & Sons, Henry
B4	Blair Strip Steel Co.	D5	Dover Nailer Co.
B5	Bliss & Laughlin Inc.	D7	Dickson Weatherproof Nail Co.
B6	Bourne Steel Corp.	E1	Eastern Gas&Fuel Assoc.
B8	Braeburn Alloy Steel	E2	Eastern Stainless Steel
B11	Buffalo Bolt Co.	E4	Electric Metallurgical Co.
B12	Buffalo Steel Co.	E5	Elliott Bros. Steel Co.
B14	A. M. Byers Co.	E6	Empire Steel Corp.
C1	Calstrip Steel Corp.	F2	Firth Sterling Steel
C2	Calumet Steel Div. Borg-Warner Corp.	F3	Fitzsimmons Steel Co.
C4	Carpenter Steel Co.	F4	Follansbee Steel Corp.
C5	Central Iron & Steel Div. Barium Steel Corp.	F5	Franklin Steel Div. Borg-Warner Corp.
C7	Cleve. Cold Rolling Mills	F6	Fretz-Moon Tube Co.
C8	Cold Metal Products Co.	F7	Ft. Howard Steel & Wire
C9	Colonial Steel Co.		

G1	Geneva Steel Co.	M1	Mahoning Valley Steel
G2	Globe Steel Tubes Co.	M2	Marion Steel Co.
G3	Granite City Steel Co.	M3	Metal Forming Corp.
G4	Great Lakes Steel Corp.	M4	Michigan Seamless Tube Co.
G5	Green Steel Co.	M5	Milcor Steel Co.
H1	Hanna Furnace Corp.	M6	Mill Strip Products Co.
H2	Haynes Stellite Co.	M7	Monarch Steel Co.
H3	Heppenstall Co.	M8	Monessen Steel Co.
H4	Hercules Steel Co.	M9	Morgan Engineering Co. Union Drawn Div.
H5	Hodell Steel Div. Borg-Warner Corp.	M10	Mosser Iron & Steel Co.
H6	Hoskins Mfg. Co.	M11	Mystic Iron & Steel Co.
H7	Howard Steel Co.	N1	National Supply Co.
H8	Hubbard Steel Foundry Co.	N2	National Tube Co.
I1	Ingersoll Steel Div. Borg-Warner Corp.	N3	Newport Steel Corp.
I2	Ingalls Iron & Steel Co.	N4	Niles Rolling Mill Co.
I3	Inland Steel Co.	N5	Northwestern Steel & Wire Co.
I4	Interlake Iron Corp.	N6	Nutting Truss Co.
I5	Ivins & Laughlin Steel	O1	Oliver Iron & Steel Co.
I6	Isaly Mfg. & Supply	O2	Otis Steel Co.
J1	Jackson Steel Corp.	P1	Pacific Coast Steel
J2	Jersey Shore Steel Co.	P2	Page Steel & Wire Co.
K1	Kaiser Steel Corp.	P3	Phoenix Iron & Steel Co.
K2	Keokuk Electro Metals	P4	Pittsburgh Steel Co.
K3	Keystone Drawn Steel	P5	Portsmouth Steel Corp.
K4	Keystone Steel & Wire	P6	Precision Tube Co.
L1	Latrobe Steel Co.	P7	Primos Chemical Co.
L2	Laclede Steel Co.	P8	Pittsburgh Screw & Bolt
L3	Latrobe Electric Steel	P9	Pittsburgh Steel Co.
L5	Lockhart Iron & Steel	P10	Portsmouth Div. Detroit Steel Corp.
L6	Lone Star Steel Co.	R1	Reeves Steel & Mfg. Co.
L7	Lukens Steel Co.	R2	Republic Steel Corp.
		R3	Rheem Mfg. Co.
		R4	Riverside Metal Co.
		R5	Roebling's Sons Co., John A.
		R6	Rome Strip Steel Co.
		R7	Rotary Electric Steel Co.
		S1	Scovill Mfg. Co.
		S2	Seneca Wire & Mfg. Co.
		S3	Shenango Furnace Co.
		S4	Sharon Steel Corp.
		S5	Shelby Steel Tube Co.
		S6	Simonds Saw & Steel Co.
		S7	Simonds Worden White Co.
		S8	Sloss-Sheffield Steel & Iron Co.
		S9	Solvay Process Div. Allied Chemical & Dye Corp.
		S10	South Chicago Mill & Forge Co.
		S11	Southwestern Steel & Supply
		S12	Spang-Chalfant Div. National Supply Co.
		S13	Standard Forging Corp.
		S14	Standard Steel Spring Co.
		S15	Stanley Works, The
		S16	Superior Steel Corp.
		S17	Superior Tube Co.
		S18	Sweet's Steel Co.
		T1	Tennessee Coal, Iron & R.R. Co.
		T2	Texas Steel Co.
		T3	Thomas Steel Co.
		T4	Timken Roller Bearing Co.
		T5	Tonawanda Iron Div. American Manganese Steel Co.
		T6	Truscon Steel Co.
		T7	Tube Reducing Corp.
		T8	Tube Turns, Inc.
		U1	Union Drawn Steel Co.
		U2	Union Electric Steel Corp.
		U3	United Engineering & Foundry Co.
		U4	United States Pipe & Foundry Co.
		U5	United States Steel Corp.
		U6	Universal-Cyclops Steel Corp.
		U7	Upson Co.
		V1	Vanadium Corp. of America
		V2	Vasconia Steel Co.
		V3	Vulcan Crucible Steel Co.
		W1	Wallingford Steel Co.
		W2	Wallace Barnes Co.
		W3	Wallace Steel Co.
		W4	Washington Steel Corp.
		W5	Weirton Steel Co.
		W6	Wheeling Steel Corp.
		W7	Wickwire Spencer Steel Co.
		W8	Wilson Steel & Wire Co., J.
		W9	Wire Reinforcement Institute
		W10	Wisconsin Steel Co.
		W11	Woodward Iron Co.
		W12	Worth Steel Co.
		Y1	Yoder Co.
		Y2	Youngstown Sheet & Tube Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.06
Riverdale,Ill. A1	3.90
Sharon, Pa. S3	4.15
Youngstown U5	3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Alabama City R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston, Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet, Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.06
LosAngeles B3	6.85	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts,Calif. C11	6.65	6.80
Prtsmth.(18) P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	6.15
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1) N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld	Galv. Stone	Galv. Stone
Aliquippa J5	10.15	12.15	
Bartonville(1) K4	10.25	11.95	
Cleveland A7	10.25	12.15	
Crawfrdsville M8	10.30	12.00	
Fostoria,O. S1	10.40	13.00	
Johnstown B2	10.25	12.15	
Kokomo C16	10.25	11.95	
Minnequa C10	10.40	12.40	
Palmer,Mass.C12	10.25	12.15	
Pitts.Cal. C11	10.60	12.50	
Prtsmth.(18) P12	10.55	12.30	
SparrowsPt. B2	10.35	12.25	
Waukegan A7	10.25	12.15	

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.50	8.80
Roebling,N.J., R5	8.85	9.10
SparrowsPt. B2	8.55	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Pa. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet, Ill. A7	4.85
KansasCity, Mo. S5	5.45
Kokomo,Ind. C16	4.95
Los Angeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-S ga. 1-1	5.50
No.Tonawanda B11	4.85
Palmer, Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
Franklin Park,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) NS	6.85
Trenton,N.J. R5	6.15
Worcester A7	6.15
Worcester T6	6.50
Worcester,Mass. A7	6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, M8 Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So. Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
Los Angeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N. J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton, N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	126
Ala.City,Ala.,17-18ga.R2	213
Aliquippa,Pa.9-14½ga.J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. M8	132
Donora,Pa. A7	130
Duluth,Minn. A7	130
Fairfield,Ala. T2	130
Houston,Tex. S5	138
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	204
Johnstown,17ga.,4" B2	207
Joliet, Ill. A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen,Pa. P7	135
Pittsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So.Chicago,Ill. R2	126
Sterling,Ill.(1) N15	130

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth, Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet, Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth,Minn. A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.06
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	6.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So. Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut 100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.35

NAILS & STAPLES, Stock

To dealers & mfrs. (1)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa. (13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M2	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	124
Houston,Tex. S5	124
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	133
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa. (32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(16) 4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

—Grade by Analysis—

Grade	$ per lb	W	Cr	V	Co	Mo	$ per lb
Reg. Carbon	0.230	20.25	4.25	1.6	12.25	...	3.535-3.675
Extra Carbon	0.270	19	4	2	7	...	2.460
Spec. Carbon	0.325	18.25	4.25	1	4.75	...	2.125
Oil Hardening	0.350	15	4	2	9	...	2.445-2.650
5% Cr Hot Wrk	0.350	13.5	4	3	...	...	1.60¾
Hi-Carbon-Cr.	0.635	6.4	4.5	1.9	...	.5	0.96-0.965
18W,4Cr,1V	1.505	6	4	3	...	6	1.190
18W,4Cr,2V	1.650	1.5	4	1	...	8.5	0.810

Tool steel producers include: A4, A8, B2, B3, O4, O6, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, Y3.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 Molinnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.,Wire
N8 Newman-Crosby Steel
N13 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P3 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga.& lighter.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Plate only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for unpreaded.
(21) New Haven,Conn. base.
(22) Del. San Fran. Bay area.
(23) 2¾ Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 0.05c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.038"; 0.038" and heavier, 0.25c higher.

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala., R2	4.90
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

PittsburgCalif. C11	4.30
TorranceCalif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

ROOFING SHORT TERNES (8 lb. Coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16 Pure Iron

Ashland,Ky.	A10	6.60
Canton,O. R2		5.65
Fairfield,Ala.	T2	5.60
Gary	U5	5.60
IndianaHarbor	I-2	5.60
Irvin,Pa.	U5	5.60
Kokomo,Ind.	C16	6.25
MartinsFy.O.	W10	5.60
Pittsburg,Cal.	C11	6.35
SparrowsPt	B2	5.60
Torrance,Cal.	C11	6.35

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.65
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary, Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10) S15	10.75
Pawtucket,R.I.(11) N8	10.75
Pawtucket,R.I.(12) N8	11.00
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
LosAngeles C1	6.40
LosAngeles M3	5.50
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	....	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	....	....
Detroit D2	5.60	6.65	7.25	....	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	....	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Con.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCaste,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	....	....
NewYork W3	....	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.orPitts.Base	....	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	....	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	....	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	....	....	10.30	12.50	15.35
Harrison,N.J. C18	....	....	10.30	12.50	15.35
NewYork W3	....	....	10.30	12.50	15.35

TIN PLATE, Electrolytic (Base Box)

	0.25-lb	0.50 lb	0.75lb
Aliquippa,Pa J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths 1½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut-lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths 1½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10 ... 3.75
Warren,O. R2 ..... 4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 ..... 5.25

TIGHT COOPERAGE HOOP

Atlanta A11 ..... 4.06
Riverdale,Ill. A1 ..... 3.90
Sharon, Pa. S3 ..... 4.15
Youngstown U5 ..... 3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Alabama City R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston, Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet, Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.06
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.66	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.C12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.55	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J., R5	8.85	9.10
SparrowsPt. B2	8.55	8.80
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..4.85
Aliquippa,Pa. J5 ..... 4.85
Atlanta A11 ..... 5.10
Alton,Ill. L1 ..... 5.05
Bartonville,Ill.(1) K4 ... 4.85
Buffalo W12 ..... 4.85
Chicago W13 ..... 5.10
Cleveland A7, C20 ..... 4.85
Crawfordsville,Ind. M8.. 5.10
Donora,Pa. A7 ..... 4.85
Duluth,Pa. A7 ..... 4.85
Fairfield,Ala. T2 ..... 4.85
Fostoria,O.(24) S1 ..... 5.35
Houston S5 ..... 5.25
Johnstown,Pa. B2 ..... 4.85
Joliet, Ill. A7 ..... 4.85
KansasCity, Mo. S5 ..... 5.45
Kokomo,Ind. C16 ..... 4.95
Los Angeles B3 ..... 5.80
Minnequa,Colo. C10 ..... 5.10
Monessen,Pa. P7 ..... 5.10
Newark, 6-8 ga. I-1 ..... 5.50
No.Tonawanda B11 ..... 4.85
Palmer, Mass. W12 ..... 5.15
Pittsburg,Calif. C11 ..... 5.80
Portsmouth,O. P12 ..... 5.25
Rankin,Pa. A7 ..... 4.85
So.Chicago,Ill. R2 ..... 4.85
So.SanFrancisco C10 ..... 5.80
SparrowsPoint,Md. B2 ... 4.95
Sterling,Ill.(1) N15 ..... 4.85
Struthers,O. Y1 ..... 4.85
Torrance,Calif. C11 ..... 5.80
Waukegan,Ill. A7 ..... 4.85
Worcester,Mass. A7, T6.. 5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 ..... 6.20
Buffalo W12 ..... 6.35
Cleveland A7 ..... 5.85
Crawfordsville,Ind. M8.. 6.20
Detroit D2 ..... 6.20
Dover,O. G6 ..... 6.20
Fostoria,O. S1 ..... 6.00
Kokomo,Ind. C16 ..... 5.70
Franklin Park,Ill. T6 .. 6.20
Massillon,O. R8 ..... 5.85
Monessen,Pa. P16 ..... 5.85
Monessen,Pa. P7 ..... 6.10
NewHaven,Conn. D2 ..... 6.50
Pawtucket,R.I.(12) N8.. 6.85
Trenton,N.J. R5 ..... 6.15
Worcester A7 ..... 6.15
Worcester T6 ..... 6.50
Worcester T12 ..... 6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4 .. 8.90
Buffalo W12 ..... 8.90
Chicago W13 ..... 8.90
Cleveland A7 ..... 8.90
Crawfordsville, Ind. M8.. 8.95
Fostoria,O. S1 ..... 8.90
Johnstown,Pa. B2 ..... 8.90
Kokomo,Ind. C16 ..... 8.90
Monessen,Pa. P16 ..... 8.90
Palmer,Mass. W12 ..... 9.20
Portsmouth,O. P12 ..... 8.90
Roebling,N.J., R5 ..... 9.20
Waukegan,Ill. A7 ..... 8.90
Worcester,Mass. A7, T6 9.20

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 ..... 8.50
Monessen,Pa. P16 ..... 8.50
Roebling,N.J. R5 ..... 8.80
SparrowsPoint,Md. B2 .. 8.60
Johnstown,Pa. B2 ..... 8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4.. 10.90
Monessen,Pa. P16 ..... 11.40
Roebling,N.J. R5 ..... 11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 ..... 6.25
Alton,Ill. L1 ..... 6.45
Bartonville,Ill.(1) K4 ... 6.25
Buffalo W12 ..... 6.25
Cleveland A7 ..... 6.25
Donora,Pa. A7 ..... 6.25
Duluth A7 ..... 6.25
Fostoria,O. S1 ..... 6.25
Johnstown,Pa. B2 ..... 6.25
LosAngeles B3 ..... 7.20
Milbury,Mass.(12) N6 .. 8.95
Monessen,Pa. P7, P16.. 6.25
Palmer,Mass. W12 ..... 6.50
Pittsburg,Calif. C11 ..... 7.20
Roebling,N.J. R5 ..... 6.55
Portsmouth,O. P12 ..... 6.25
So. Chicago,Ill. R2 ..... 6.25
So.SanFrancisco C10 ..... 7.20
SparrowsPoint,Md. B2.. 6.35
Struthers,O. Y1 ..... 6.25
Trenton,N.J. A7 ..... 6.55
Waukegan,Ill. A7 ..... 6.25
Worcester A7, T6, W12.. 6.55
Worcester,Mass. J4 ..... 6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5 ..... 5.90
Alton,Ill. L1 ..... 6.10
Buffalo W12 ..... 5.90
Cleveland A7 ..... 5.90
Donora,Pa. A7 ..... 5.90
Duluth,Minn. A7 ..... 5.90
Johnstown,Pa. B2 ..... 5.90
Los Angeles B3 ..... 6.85
Monessen,Pa. P7, P16 .. 5.90
NewHaven,Conn. A7 ..... 6.20
Palmer,Mass. W12 ..... 6.20
Pittsburg,Calif. C11 ..... 6.85
Portsmouth,O. P12 ..... 5.90
Roebling,N. J. R5 ..... 6.20
So.Chicago,Ill. R2 ..... 5.90
So.SanFrancisco C10 ..... 6.85
SparrowsPoint,Md. B2 .. 6.00
Torrance,Calif. C11 ..... 6.85
Trenton, N.J. A7 ..... 6.20
Waukegan,Ill A7 ..... 5.90
Worcester,Mass. A7 ..... 6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2 ... 126
Ala.City,Ala.,17-18Ga.R2 213
Aliquippa,Pa.9-14½ga.J5 130
Atlanta A11 133
Bartonville,Ill.(19) K4 .. 130
Crawfordsville,Ind. M8 .. 132
Donora,Pa. A7 130
Duluth,Minn. A7 130
Fairfield,Ala. T2 130
Houston,Tex. S5 138
Johnstown,Pa. B2 130
Johnstown,17ga.,6" B2 .. 204
Johnstown,17ga.,4" B2 .. 207
Joliet, Ill. A7 130
KansasCity,Mo. S5 142
Kokomo,Ind. C16 132
Minnequa,Colo. C10 138
Monessen,Pa. P7 135
Pittsburg,Calif. C11 153
Portsmouth,O.(18) P12 .. 127
Rankin,Pa. A7 130
So.Chicago,Ill. R2 126
Sterling,Ill.(1) N15 130

FENCE POSTS

ChicagoHts.,Ill. C2 140
Duluth, Minn. A7 140
Franklin,Pa. F5 140
Huntington,W.Va. W7 ... 140
Johnstown,Pa. B2 140
Marion,O. P11 140
Minnequa,Colo. C10 130
Moline,Ill. R2 136

So.Chicago R2 140
Tonawanda,N.Y. B12 140
Williamsport,Pa. S19 ... 150

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill. (19) K4	143
Crawfordsville, Ind. M8	145
Donora,Pa. A7	140
Duluth, Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12..	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	128
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth,Minn. A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.06
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	6.90
Rankin,Pa. A7	6.25
So. Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.35

NAILS & STAPLES, Stock

To dealers & mfrs. (1)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa. (13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M3	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	128
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1.	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.30
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

Grade	$ per lb	W	Cr	V	Co	Mo	$ per lb
Reg. Carbon .	0.230	20.25	4.25	1 &	12.25	. .	3.535–3.675
Extra Carbon	0.270	19	4	2	7	. .	2.460
Spec. Carbon .	0.325	18.25	4.25	1	4.75	. .	2.125
Oil Hardening.	0.350	18	4	2	9	. .	2.445–2.450
5% Cr Hot Wrk	0.350	13.5	4	3	. .	. .	1.60¾
Hi-Carbon-Cr.	0.635	6.4	4.5	1.9	. .	5	0.96–0.965
18W,4Cr,1V .	1.505	6	4	3	. .	6	1.190
18W,4Cr,2V .	1.650	1.5	4	1	. .	8.5	0.810

Tool steel producers include: A4, A5, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, V3.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N3 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N18 New Dalzhoe Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

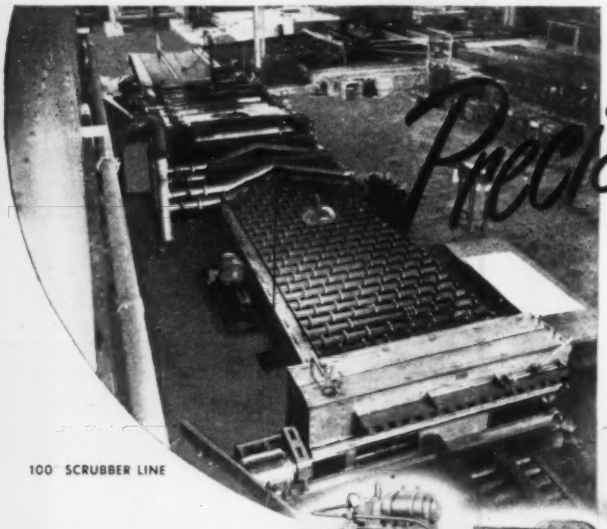
V3 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West. Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga.& heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven,Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.00c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.35c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.030"; 0.036" and heavier, 0.25c higher.

STEEL MILL EQUIPMENT

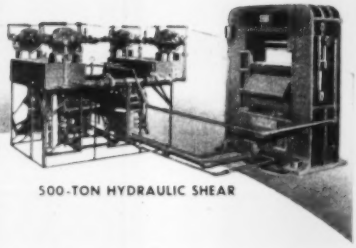


100 SCRUBBER LINE

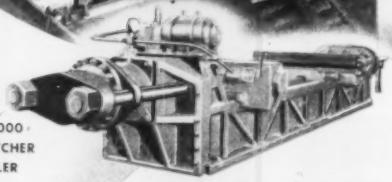
Precision built

BY

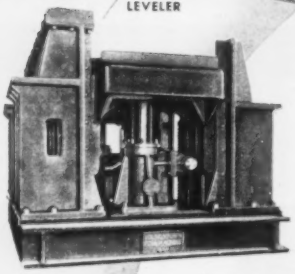
F & Y



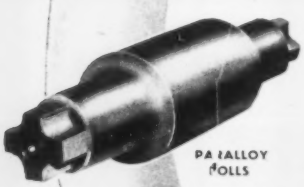
500-TON HYDRAULIC SHEAR



800 000 STRETCHER LEVELER



SLAB PILER



PARALLOY ROLLS

Check this List for the Products You Need

- PARALLOY ROLLS (Pinch, Coiler, Tension, Steel Mill)
- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—Traveling and Lifting Tables
- Continuous PICKLING Lines—ROLLER LEVELERS
- FURNACE Charging Equipment—Furnace Pushers
- Strip Steel COILERS and REELS—SCRAP BALLERS
- RAILROAD Spike Forming Machines—ROLL LATHES
- Sheet GALVANIZING Lines—Wire Patenting Frames
- Stretcher Levelers—Angle and Shape Straighteners
- Rolling Mill Tables—Gear and Individual Motor Types
- DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.18	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛" 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ⅜" and ½". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill., 2 points lower discount I-1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa-J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base Both Sides 10%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	....	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	34.00	....	....	26.00	35.92–36.50	....
317	34.50	39.00	....	....	....	....	....
318	33.50	38.00	....	....	....	....	....
321	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	165.00
Nickel	33.55	45.15	41.00	54.00	....	....	....
Inconel	41.23	54.18	....	....	....	....	....
Monel	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers.)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap, and Sleigh Shoe 21
Tire bolts 12
Boiler & Fitting-Up bolts 31

NUTS

H.P. & C.P. Square:	Reg.	Heavy
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or key quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
½-in. & smaller	35	
⅝-in. to ¾-in.	28.5	
⅞-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 & 10
Plated finishes ...31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. .. 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. 4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in.. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 35
¼-in. diam. & larger 16
N.F. thread, all diams. . 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
½-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content, 70%, $43; 60%, $40.
Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17.18.20	60.72	17.85
8 to 16	48.60.72	17.85
7	48.60	19.57
6	48.60	20.95
	CARBON	
35. 40	110	8.03
30	65.84.110	8.03
24	72 to 104	8.03
17 to 20	34.90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 303 and 309 Es2.
Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.
Cleveland, strip A7.
Detroit, strip M1 quotes 34.00 on Type 301, 36.50 on 302 38.50 on 304, 58.50 on 316, 52.00 on 347, 30.50 on 410, and 31.00 on 430.
Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip and wire C18.
Massillon, O., all products, R2.
McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.
McKeesport, Pa., bars, sheets except Type 416 U5.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheet & strip C18.
Munhall, Pa., bars U5.
Pittsburgh, sheets C18.
Reading, Pa., strip except 34.25c for Type 301 and 56.00c for Type 309; bars, except 31.50c for Type 301 and 43.25c for Type 309 C4.
Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.
So. Chicago, Ill., bars & structurals U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars, U4.
Wallingford, Conn., strip, W2 quotes 0.25c higher.
Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.
Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 62.00c, strip 64.00c W4.
Watervliet, N. Y., structurals & bars A4 quotes slight variations on Types 301-347.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol . 25.00-33.50
Per ton bulk, ovens
Sulphate of ammonia .$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron	Cents
98+% Fe, carlots..	16.00
Swedish, c.l.f. New York, in bags ...	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe.	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns ...	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Brass, 10-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 10 tons	50.00
Copper:	
Electrolytic	43.25
Reduced	33.75-37.00
Lead	25.50
Magnesium	75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	83.00
Nickel-Silver, 10-ton lots	44.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302 ..	83.00
Zinc, 10-ton lots	23.00-30.50
Tungsten	Dollars
99%, minus 80 to 200 mesh, freight allowed: 1000 lb and over ..	4.00
Less than 1000 lb ..	4.15
98.8% minus 65 mesh, freight allowed: 1000 lb and over ...	4.15
less than 1000 lb ..	4.25
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.85
200 to 500 lb	3.10
less than 200 lb ..	3.25
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

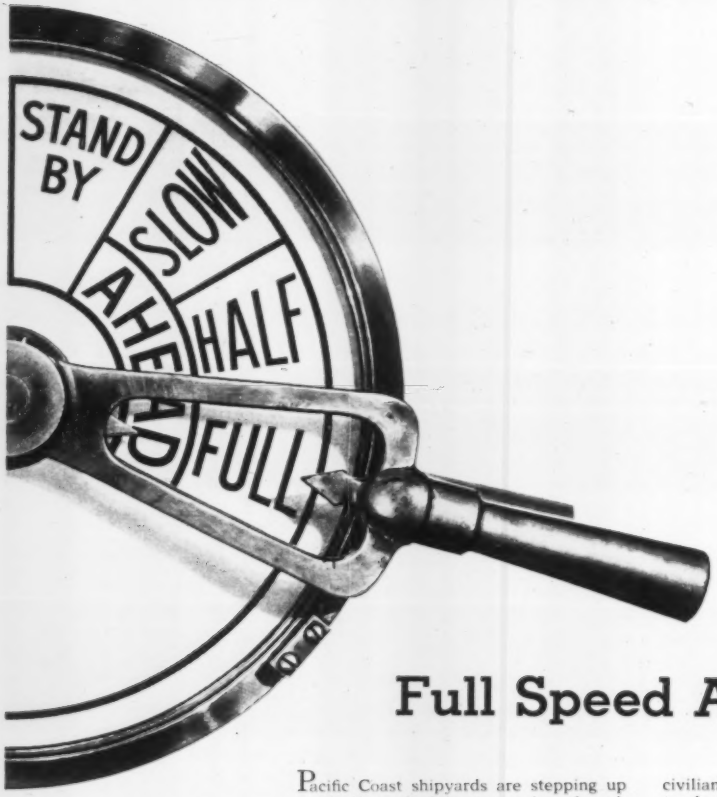
BEEHIVE OVENS

Connellsvil,fur. .$14.50-15.00
Connellsvil,fndry. .17.00-18.00
New River, foundry ...21.30
Wise county, foundry ..15.95
Wise county, furnace ..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens .$22.75
Everett, Mass., ovens
New England, del. .*24.80
Chicago ovens 23.00
Chicago, del. 24.40
Terre Haute, ovens ... 22.50
Milwaukee, ovens ... 23.75
Indianapolis, ovens ... 22.75
Chicago, del. 26.42
Cincinnati, del. 25.85
Detroit, del. 26.85
Ironton, O., ovens ... 22.50
Cincinnati, del. 25.12
Painesville, O., ovens.. 24.00
Cleveland, del. 25.82
Erie, Pa., ovens 23.50
Birmingham, ovens ... 20.30
Birmingham, del. ... 21.69
Philadelphia, ovens ... 22.70
Neville Island, Pa., ovens 23.00
Swedeland, Pa., ovens. 22.60
St. Louis, ovens
St. Louis, del. 25.40
Portsmouth, O., oven. 22.50
Cincinnati, del. 25.12
Detroit, ovens 24.00
Detroit, del. 25.00
Buffalo, del. 26.80
Flint, del. 26.50
Pontiac, del. 25.47
Saginaw, del. 26.92

* Or within $4.15 freight zone from works.



Full Speed Ahead

Pacific Coast shipyards are stepping up production schedules to repair and modernize ships and build barges vital to the preparedness program.

Helping shipyards *and other industries* meet the demands of national security, Kaiser Steel is on a round-the-clock schedule to produce steel plate and other critically needed products.

Despite heavy requirements of the preparedness program, western manufacturers are still able to get steel for essential civilian requirements. One important factor has been the constant expansion of Kaiser Steel facilities.

A new open hearth furnace—Kaiser Steel's eighth—has raised ingot capacity to 1,380,000 tons a year—which is more than *double* the amount produced by Kaiser Steel in 1944, the peak war year!

More evidence that the West Coast's only integrated, independent steel plant is helping to build a stronger West...and a stronger nation!

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars carbon bars • structural shapes • cold rolled strip • cold rolled sheet • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York (c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.26	6.40	6.98	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.06	6.20	6.78	7.68
Phila. (city)	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††§	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††§	5.80	6.05	7.35
Pitts. (w'hse)	5.60	6.40*	7.75	5.85-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse)	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans City (w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city)	5.75	6.55	6.90‡	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm (w'hse)	5.60	6.40	6.75‡	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.70	9.05‡	6.60	8.90	6.55	7.75	...	6.55	6.40	9.20
L. A. (w'hse)	6.35	7.90	8.85‡	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco	6.65	7.80‡	8.90‡	6.80	...	6.45	8.20	...	6.46	6.50	8.60
Seattle-Tacoma	7.05	8.40‡	9.20‡	7.30	...	6.75	9.10	11.15	6.85	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ‡—500 to 1499 lb; ‡—450 to 1499 lb; §—3500 lb and over; §—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Indian manganese, 46-48% nearby, $1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	27.00-28.00
46% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00
Molybdenum	
Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload, lump, bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicon Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25%, based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., $1.13.

NOTE: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 131, Aug. 20 issue; calcium, zirconium and briquetted alloys, page 129, Aug. 27. Refractories prices also were published on page 129, Aug. 27 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

Aug. 30	$44.00
Aug. 23	44.00
July 1951	44.00
Aug. 1950	40.00
Aug. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point-ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Heavy Melting Steel (Grade) 1 Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 2 Heavy Melting	—$2.00
3. No. 1 Bushelling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Bushelling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry Steel:	
20. 2 feet and under	+ 2.00
21. 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 5.00
23. Alloy Free turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Bushelling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 Oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	+ 8.00
32. Boilers	+ 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.

(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3.

(4) For preparing into Grade No. 25, $6.

(5) For preparing into Grade No. 19, $6.

(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) For preparing into Grade No. 17 or Grade No. 21, $11.

(8) For preparing into Grade No. 18 or Grade No. 20, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

(3) For preparing into Grade No. 16, $4.

(4) For preparing into Grade No. 17, $5.

(5) For preparing into Grade No. 18, $7.

(6) For preparing into Grade No. 21, $4.

(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $8.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commissions shall be payable to a broker in excess of $1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.

For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdnum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.

Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 53c; Butler, Pa., 65c.

Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 73c; Cleveland, 76c.

Coatesville, Pa., 50c; Conshohocken, Pa., 20c.

Detroit, 55c; Duluth, Minn., 50c.

Harrisburg, Pa., 51c; Houston, Tex., 57c.

Johnstown, Pa., 75c.

Kansas City, Mo., 78c; Kokomo, Ind., 51c.

Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.

Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.

St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.

Warren, Pa., 75c; Weirton, W. Va., 70c.

Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.00
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory, prep'd.	33.00
Bushelings new factory, unprep'd.	28.00
Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast	58.00-60.00

* F.o.b. shipping point.

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The Metal Market

Acute shortages of copper, lead and zinc develop as strike paralyzes nonferrous metal mining and smelting. Some metalworking industries may be forced to cut use sharply

MANY metalworking industries may be forced to suspend operations this week due to lack of lead and zinc supplies.

Partial relief from the acute shortage, arising from the nation-wide strike in the nonferrous metals industry, may come through the government's permanent stockpile.

The National Production Authority claims the present situation constitutes an emergency and, therefore, justifies withdrawal of tonnages. The agency asked the Munitions Board late last week to release 25,000 tons each of lead and zinc to keep the defense program running.

Loss of zinc production is an especially severe blow to the brass mills which asked for 16,000 tons in September. They were allocated only 13,000 tons for that month. An official of NPA said that if the strike continues, "we may not be able to give them anything."

Setting a precedent for the release of these tonnages, the Munitions Board recently turned over 25,000 tons of copper to American industry. This action was taken to provide tonnages needed to repair damages caused by midwestern floods and to replace metal lost as a result of the recent six-week strike at the Garfield copper smelter of Kennecott Copper Corp. in Utah.

The strike has halted about 95 per cent of the nation's copper output. It is costing the United States 40 per cent of its zinc production and nearly two-thirds of its lead output.

Members of the International Union of Mine, Mill & Smelter Workers are the only ones officially on strike, although other unions are not crossing picket lines. As this issue goes to press, the workers are refusing to accept the Wage Stablization Board's demand that they return to work before the Board considers the merits of their fight with the nation's largest copper producers, including Kennecott Copper Corp., Anaconda Copper Mining Co., Phelps Dodge Corp. and American Smelting & Refining Co.

Builds New Nickel Town

International Nickel Co. of Canada Ltd., Copper Cliff, Ont., is establishing a new community, Lively, in the Sudbury district. Located in the midst of the world's largest known nickel deposits, Lively will help to carry out a major change in International Nickel's mining operations. To date, more than 1700 dwellings have been built in various towns in the Sudbury district by the company. More than $9 million have been allocated since 1941 for new homes and educational and recreational facilities for the families of the company's employees.

During the last ten years, Inco has been engaged in a continuing program of extending its regular underground operations at Creighton, Garson, Levack, and Frood mines. In addition, new underground mines are being brought into production at Stobie, Murray and Creighton. This expansion will offset tonnages obtained from the company's open pits where operations are scheduled to be completed about 1953.

Expands Alumina Facilities

Aluminum Ore Co., a subsidiary of Aluminum Co. of America, Pittsburgh, will expand its alumina producing capacity by 180,000 tons annually through the addition of new production facilities at an existing plant in Mobile, Ala. The company also is erecting a new alumina works at Bauxite, Ark., in addition to operating plants at Mobile and at East St. Louis, Ill.

The new construction program, together with the capacity being added in Arkansas, will boost the Alcoa's subsidiary's alumina production capacity by about 70 per cent when completed. Construction at Mobile is scheduled to begin soon and production of alumina is expected to start by late 1952.

Brass Product Prices Pegged

Ceiling prices for brass mill products sold by producers were established by the Office of Price Stabilization, effective Aug. 23. The regulation does not include fabricated commodities made from brass mill products or any copper or copper alloy product produced by a copper refiner or smelter.

The regulation covers all sales by a producer. In general, ceiling prices are determined from the applicable dollars-and-cents base prices specified in the regulation, with plus or minus adjustments to reflect all customary quantity differentials, extras, allowances, discounts, etc., which the producer had in effect on Dec. 31, 1950.

The ceiling price for any copper base alloy not specifically listed in the regulation is determined by reference to specified base prices, subject to customary methods of differential pricing.

Ceiling prices for condenser or heat exchange tube are determined from applicable base prices and differentials specified in the regulation.

Premiums may be charged for deliveries from points in California, Oregon and Washington, if the producer had such premiums in effect on Dec. 31, 1950.

Within 30 days after the effective date of the regulation, producers must file with OPS in Washington, all of their published price lists showing quantity differentials, extras, allowances, discounts, etc., in effect on Dec. 31, 1950, which are used in determining ceiling prices.

During the General Ceiling Price Regulation base period (Dec. 19, 1950 to Jan. 25, 1951) both imported and domestic copper was selling generally at 24.50c a pound, with 2 cents a pound duty added to foreign copper. Since the GCPR base period the price of copper has increased materially. Although the duty on copper was suspended on Apr. 1, 1951, an agreement between the United States and Chile resulted in a price of 27.50c a pound. Brass mills and other domestic users of imported copper have been paying this price since May 1951.

Plans New Aluminum Plants

Harvey Machine Co., Los Angeles, accepted the terms of a proposed $46 million government loan to build two aluminum refining plants. The company will use $34 million of the total for construction of a three-potline aluminum plant near Kalispell, Mont., and $12 million for an alumina plant near Everett, Wash., north of Seattle. The Kalispell plant will have an annual capacity of 54,000 tons. Bauxite will come from Surinam.

While details of the loan terms have not been released, it is understood Harvey Machine is to put up $3.5 million in cash, equipment, land and engineering; is to offer $3.5 million of additional stock to some 1500 independent fabricators throughout the country who would have first call upon ingots up to the percentage of capital stock held.

Kaiser Expanding Facilities

Initial results of Kaiser Aluminum & Chemical Corp.'s mine to metal expansion program, which began in March, will be felt in November with the pouring of the first primary aluminum metal at a new 200-million-pound a year reduction plant now under construction near New Orleans.

Henry J. Kaiser, president, said the company will spend $14.5 million developing 11,000 acres of bauxite properties it has purchased or optioned on the island of Jamaica in the Caribbean. This expenditure includes adaption of the Baton Rouge, La., plant to process the ore. First quantity shipments of the ore are scheduled for September, next year.

Mr. Kaiser also said plans call for continued increases in capacity at the corporation's aluminum fabrication plants in 1952. Itemizing, Mr. Kaiser said:

The Trentwood rolling mill, near Spokane, Wash., currently producing about 270 million pounds of flat-rolled products annually, is increasing capacity to 360 million pounds a year;

Rod, wire and cable at the Newark, O., plant from 54 million to 70 million pounds; the Alloys Division at Newark from 60 million to 96 million pounds of alloy ingots and pig;

Extrusions from the Halethorpe, Md., plant from 12 million to 18 million pounds, and,

The Permanente, Calif., foil plant from 10 million to 12 million pounds.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 38.50c; 80-10-10 (No. 305) 34.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb, c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $195-$200 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99% $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill; effective Aug. 29, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.11; 80% 39.67; best quality, 20-15, nickel silver, 18% 55.14; phosphor-bronze grade A, 5% 41.07.

Rod: Copper, hot-rolled 37.53; cold-drawn 38.78; yellow brass free cutting 32.63; commercial bronze, 95% 41.30; 90% 40.82; red brass 85% 39.83; 80% 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.28; commercial bronze, 90% 43.70; red brass, 85% 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95% 41.99; 90% 41.42; red brass, 85% 40.43; 80% 39.96; best quality brass 39.44.

(Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18; 100,000 lb lots 29.95; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In. Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round— R317-T4, 17S-T4	R317-T4	Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 24.00c, f.o.b. mill, 36,000 lb and over. Extras, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Aug. 1-30	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July 2-31	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 28-30	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 18-27	24.50	16.80	17.50	106.00	19.00	42.00	56.50	87.75
June 15-16	24.50	16.80	17.50	111.00	19.00	42.00	56.50	87.75
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	56.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	59.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	59.50	90.16
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	59.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	59.50	88.890

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 77.7c; 100 or 350 lb drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9900 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.19; 500 to 999 lb, $1.195; 200 to 499 lb, $1.20; less than 200 lb, $1.215. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.0009; more than 2000 lb, 98.09c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 87.23c; 100 lb kegs 88.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 83 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 78 cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass screens 16.00; ziney bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b point of shipment)

Unsweated zinc dross, 12.25c; new clippings and trimmings, 14.50; engravers' and lithographers' plates, 14.50; die cast slabs, min. 90% 12.25; old zinc scrap, 11.25c; forming and stamping dies, 11.25; new die cast scrap, 10.75; old zinc die cast radiator grills, 10.50; old die cast scrap, 9.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 17.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb. Used storage batteries (in boxes) drained of liquid, 6.60c for 15,000 lb or more; 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 15.25c per lb. In addition, brokerage commissions are permitted.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50, high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

Sheets, Strip . . .

Sheet and Strip Prices, Page 153 & 154

New York—Most sheet sellers are out of the market for fourth quarter and are taking little tonnage for delivery beyond. Some consumers have actually presented shipment requests for as late as third quarter next year, but almost without exception they have been turned down flatly as producers do not care to commit themselves that far ahead even though some requests carry CMP ratings. Producers say that the amendment to M-1, which virtually eliminates first-come first-served booking, will mean little before January.

Boston—Demand for electrical and enameling sheets and strip has softened. Cancellations are appearing from builders of fractional horsepower motors, opening some mill space for November - December. Enameling stock presents no serious problem. Orders for carbon, stainless and other grades of sheets and strip are well maintained, but pressure has eased.

Buffalo—Labor difficulties in the cold strip mill of Bethlehem Steel Co. here hampered production last week. About 1000 cranemen staged a sickness walkout on Tuesday over a dispute involving incentive pay. During the walkout the cold strip mills were down.

Pittsburgh—NPA ruling allowing restoration of normal producer-customer relationships will reduce long costly freight hauls, while supply bottlenecks at customers' plants will receive immediate attention from producers. September 10 is deadline for acceptance of non-rated orders. Producers are to cancel all non-rated orders unfilled as of that date.

Marsam Corp. is now operating a pickling, shearing and slitting installation at McKees Rocks, Pa. Capacity is listed as 20,000 tons monthly handling 10 to 20-gage coils one to 48-inches wide.

Cleveland—Sheetmakers do not anticipate much change in supply conditions over the remaining months of the year. While pressure from consumer durable goods manufacturers has been off somewhat recently, slack from this direction is being quickly taken up from rising defense requirements. The mills are over-sold for fourth quarter and have been forced to turn away considerable certified orders. Only a few cancellations have been received by the mills so far, and it doesn't look as though much tonnage will be freed even after screening of mill schedules by NPA.

Cincinnati—District sheet mills continue to reject CMP tickets because of the overloaded condition of fourth quarter books. All indications point to increasing shortages. A few cancellations are current.

Chicago—Sheetmakers are now in position to advise customers in consumer goods industries as to quotas which can be accepted in November and December. First quarter notifications will be sent out as quickly as possible. Calendar year 1950 shipments to these consumers is the general pattern in establishing quotas.

St. Louis—Sheet mills are deluged with CMP tickets. One producer whose free tonnage was 46 per cent of capacity estimates 50 per cent more tickets have been proffered than he could cash. He anticipates the confusion won't ease before the first quarter. In this district sheet consumers have fair inventories. August sheet shipments were about 15 per cent over July's.

Los Angeles—With northern California canmakers on edge over supplies, large proportion of sheet coil production of Geneva Steel Co., Geneva, Utah, is being diverted to Columbia Steel Co.'s Pittsburg, Calif., tin plate mill to increase production.

Wire . . .

Wire Prices, Page 155

Chicago—Sales of wire rope are declining but are not unexpected. Coal mining operations in Illinois and Indiana are lowest in 10 years, some mines working only two days a week and loading only one. No upturn is expected until fall. It is reported it will be about 30 days before Missouri-Kansas flood areas can appraise their needs for merchant products principally nails and fence. Stocks of fence are light in general and jobbers' inventories of nails are low with only limited stocks in hands of dealers.

Boston—Moderate slackening in orders for some products made of wire has had only a slight effect on wire demand. More consumers are adding to inventories. With few exceptions orders for screws, precision wire springs and formed wire goods are less feverish.

Steel Bars . . .

Bar Prices, Page 153

Cleveland—Pressure for bars continues as strong as ever and there is little chance supply conditions will ease in fourth quarter. However, the confusion in the market is tending to clear away as consumers become adjusted to Controlled Materials Plan distribution regulations. The bar mills have been unable to care for all the certified orders coming to them and the only hope for satisfying some of these rejected orders hinges on a substantial volume of order cancellations. So far cancellations have not amounted to much in the way of tonnage, but thorough screening of fourth quarter schedules by NPA may make it possible for some stranded CMP orders to find position on mill books.

New York—Some hot bar consumers, turned away by the mills for fourth quarter tonnage because of over-sold conditions, have gone to NPA for relief only to be told to go back to their regular suppliers as there may be cancellations which would permit acceptance of their orders. However, these buyers have not had much success to date. Cancellations have been few and far between, with buyers on the waiting list. There has been some acceptance of tonnage for first quarter, particularly where consumers have had DO-rated tonnage on mill books for fourth quarter, only to find that it can't be handled in that period and where they have promptly revalidated their orders within the 7-day period allowed. In general, however, producers are still hesitant to accept orders for handling beyond fourth quarter.

Boston—Allocations to converters in more cases are now based on tonnage taken in the first six months this year rather than first nine months of 1950. Fourth quarter capacity is filled at mills with scattered CMP allotments unplaced. Allotment orders are coming in for first quarter. Forge shop consumption is high, also order backlogs. Wrench orders are heavy, close to a half million dollars worth being placed with New England shops.

Philadelphia—Hot carbon bar producers appear moving cautiously in accepting business for delivery beyond turn of the year. They are taking tonnage from their regular customers for first quarter, plus such top scale military directives as they may receive. Some of the largest producers are limiting acceptances to military directives.

Seattle—Rolling mills in this area hold large order backlogs. While they are booking small tonnages, orders requiring quick delivery are being declined. Bulk of current output is reinforcing bars for which an insistent demand is reported.

Plates . . .

Plate Prices, Page 153

Boston—Weldment shops will need steel plates beyond fourth quarter allotments. Mills are sold up well into 1952. CMP tonnage is below what weldment shops were getting. Bulk of orders are in A product list with machine tool and rolling mill equipment outstanding. Appeals are being made to up allotments to meet defense supporting requirements in other directions. Bath Iron Works, Bath, Me., booked contract for an ocean escort ship for the Bureau of Ships, Navy.

New York—Plate producers are oversold on rated tonnage for fourth quarter. Theoretically their set-asides amount to 95 per cent, but most, if not all, sellers have sufficient rated work on hand to take up their entire capacity. Hence, the 5 per cent or so that NPA requested be held for additional tonnage cannot be supplied unless there are order cancellations. There is a possibility cancellations will come through once Washington finishes screening schedules but how much tonnage will be freed remains to be seen.

Philadelphia—Inquiries for plates for shipment next year are increasing, but producers generally are moving slowly in the acceptance of such tonnage. Substantial orders for oxygen pressure cylinders have been placed by the Corps of Engineers, Philadelphia. Both Harrisburg Steel Corp. and Taylor Wharton Iron & Steel Co. have contracts exceeding $250,000 each.

Pittsburgh—Heavy demand for light plates continues. Producers are turning away rated orders. Fourth quarter is entirely taken up by directives and rated orders. Car and locomotive builders' cutbacks do not reflect in the supply picture. Carryover from third quarter is exceptionally large and scheduling difficulties for fourth quarter are plaguing producers.

Cleveland—Plate sellers are booked up solidly through fourth quarter. Any hope for getting position on mill books largely hinges on order cancellations which may come through as result of screening of schedules by

NPA. However, there is little chance substantial tonnage will be cancelled, and any openings which do appear in schedules will be quickly filled by requirements of an essential nature still awaiting placement.

Los Angeles—With petroleum refinery activity at boom proportions, fabricators' needs for all plate gages are mounting. Users are getting less plate tonnage from western mills but deliveries from eastern mills are steady.

Seattle—Small fabricators are handicapped by the plate shortage. As a result they are hesitant about entering bids because of uncertain tonnage allotments. Several important industrial construction jobs, involving sizable tonnages, are expected to be acted on shortly.

Tubular Goods . . .

Tubular Goods Prices, Page 157

Boston — Not until first quarter, possibly as late as March, will distribution of some tubular products, notably seamless and tubing specialties, be aligned to the normal customer relationship pattern up to 15 days before lead-time. Jobbers are taking in all tonnage permitted under M-6. Pipe inventories, 4-in. and under, are in better shape but larger sizes are more difficult. No direct shipments of electric welded pipe over 4-in. for the balance of the year are possible with some mills.

Seattle—Cast iron pipe trade is sluggish, no important jobs being up for figures currently. Several large contracts for government projects are pending. Long time delivery, 180 days, handicaps cast iron pipe producers in competition for business with other classes of pipe.

Structural Shapes . . .

Structural Shape Prices, Page 153

Philadelphia—Phoenix Iron & Steel Co., Phoenixville, Pa., has increased its price on structural shapes from 4.95c to 6.25c, base, effective Sept. 1. The increase is equivalent to $26 a ton. In advising customers, the company explained it was going to "price and invoice our products in terms of a single 'base price', which will include additional charges heretofore separately stated, plus any applicable standard extras. This action is based upon an official interpretation by the OPS furnished in response to this company's request for a specific ruling. Accordingly, our price on structural steel shapes will be 6.25c base, Phoenixville, with all applicable extras shown in our standard classification of extras to be added."

Boston—Bridges to be readvertised approximate 23,000 tons. Low quotation on 4560 tons, Forest Hills overpass, Boston, was $313 per ton in place. Bulk of industrial defense expansion in this area is under contract. Major problem is straightening out backlog schedules between structural mills and fabricating shops.

Los Angeles — Pressure for structurals, especially heavier shapes including 3 to 6 in. channels, and 4 in. I-beams, is weaker. School construction costs in San Diego county jumped 30 per cent last quarter; are now 100 per cent higher than last year.

San Francisco—Shipbuilding Division, Bethlehem Pacific Coast Steel Corp., San Francisco yard, will require 33,000 tons of structural steel for five ships it will build for the Maritime Commission. First keel will not be laid until early next year. Meanwhile, needed materials will be accumulated over the remainder of this year.

Seattle — Substantial volume of shape inquiry is before the market. Heavy tonnages are pending, chiefly for public works. Largest pending tonnage at present is 2000 tons for the Weyerhaeuser bleach kraft plant at Everett, Wash. Several sizable Alaskan contracts are expected to be closed shortly.

Rails, Cars . . .

Track Material Prices, Page 155

New York—Freight car demand is picking up a bit, with the Norfolk & Western and Virginian inquiring for 1000 freight cars each and the Bessemer & Lake Erie for 500. Awards continue light.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 153

Washington—Effective Oct. 1, concrete reinforcing bars will be changed from a Controlled Materials Plan class B product to a class A product. As a result fabricators must obtain allotments from their customers for scheduled deliveries after Sept. 30. Previously fabricators received their allotments from NPA and placed orders for reinforcing bars as controlled materials with the steel mills. They were not required to obtain allotments from customers who bought bars from the fabricators as a class B product. As a further result of the change in classification, reinforcing bars must be figured in totaling the amount of steel used in construction in connection with self-authorization of orders for controlled materials in applying to NPA for authorized construction schedules and related allotments of controlled materials.

Boston — Substantial lots of concrete reinforcing steel bars are being bought with unplaced volume somewhat smaller. Housing and bridges account for the bulk of activity, an exception being large tonnage for a forge-press shop for the Wyman-Gordon Co., North Grafton, Mass. Other contracts exceeding 1000 tons include a bridge, Amesbury, Mass., and a housing project, Providence, R. I., both to Bethlehem Steel Co. Low price on bars for the Forest Hills overpass, Boston, was $200 per ton.

Chicago—The recent NPA directive requiring reinforcing bar fabricators to get allotments from users for deliveries after Sept. 30 is causing some suppliers to fear a deluge of requests for shipments before the deadline. Steel supply, however, is so low as to prevent extensive fulfillment of such. Furthermore, for some time most suppliers have been confining commitments to types of jobs for which obtaining allotments should not be difficult.

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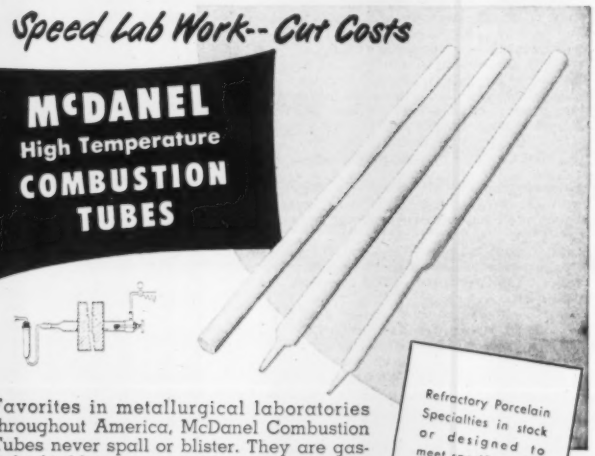

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Iron Ore . . .

Iron Ore Prices, Page 159

Cleveland — Gain in shipments of Lake Superior iron ore for the season to Aug. 27 over the like period a year ago is now 12,161,597 tons, the total this year being 57,081,305 tons against 44,919,708 tons. The season increase for United States ports alone is 11,860,651 tons.

Shipments for the week ended Aug. 27 totaled 3,008,179 tons compared with 3,048,697 tons for the preceding week and 2,894,694 tons for the like week last year. Average daily loading rate is being maintained well above the 400,000-ton figure, having totaled 419,509 tons for the week ended Aug. 27.

Pig Iron . . .

Pig Iron Prices, Page 152

Boston—Except for basic and special analysis irons, consumers are getting steady shipments from suppliers. In some cases pressure for tonnage has eased. Among larger consumers, one textile mill equipment shop is not melting as heavily.

New York — With the passing of Labor Day the summer vacation season is practically concluded and stronger pressure for pig iron is anticipated. Only in few cases do district foundries appear to have a month's supply of iron on hand; actually most of them have no more than two weeks' supply. A stepping up in demand for castings will add to pressure. Contributing to the stringency, one producer, which ships into this area, will take a furnace off in September leaving this interest with little merchant iron for a few weeks.

Philadelphia—While some gray iron foundries appear in fairly comfortable position as to pig iron, they are the exception and the over-all situation with regard to this material remains light. Basic iron consumers are particularly hard pressed.

Cleveland—Post-holiday increase in demand pressure is expected by merchant pig iron sellers. However, furnaces are fully committed and consumers will have to worry along pretty much as they have over past months. Summer vacation shutdowns permitted some improvement in foundry raw material inventories, but few shops are carrying as much as 30-day pig iron stocks. This is especially true of those foundries on defense work. The volume of military and related castings demand is rising. Machine tool needs are noticeably heavier. Delivered prices on pig iron are up slightly as a result of the 5 per cent increase in freight rates which became effective Aug. 28.

Cincinnati—District foundries are primed for heavier melt after Labor Day. Furnace shipments remain constant, so that any expansion in schedules must rest on more liberal proportions of scrap.

Chicago—Foundry operations are spotty with some shops fully occupied and others slack. This is not reflected in overall demand for pig iron. Suppliers report demand exceeds supply by a good margin.

Chrome Ore . . .

Washington — Domestic consumption of chromite in the second quarter 1951 decreased to 300,694 net tons from 306,165 tons in the first quarter, reports the Bureau of Mines. Consumption of 140,749 tons, or 47 per cent, was for metallurgical purposes; 101,457 tons, or 34 per cent, for chromium refractories; 48,816 tons, or 16 per cent, for chromium chemicals; 9672 tons, or 3 per cent, for miscellaneous purposes, chiefly in repairing basic-furnace linings.

Stocks of chromite on hand in consumers' yards totaled 527,098 tons on June 30 compared with 591,528 tons in Mar. 31, 1951. Of the total on hand at the end of second quarter, 221,530 tons were metallurgical, 254,967 refractory, and 50,601 tons chemical.

Domestic production of chromite totaled 576 tons in the second quarter; all came from Butte county, California.

Imports of chromite in second quarter decreased 11 per cent from first quarter and totaled 319,371 tons. The Union of South Africa was largest supplier, furnishing 26 per cent of the total, mainly chemical grade; the Philippines supplied 22 per cent, mainly refractory; Southern Rhodesia furnished 19 per cent, both metallurgical and refractory; Turkey supplied 18 per cent, the big bulk of which was chemical grade; Cuba shipped 7 per cent, all refractory; New Caledonia furnished 5 per cent, all metallurgical; the balance of 3 per cent was supplied by Yugoslavia and India, all metallurgical grade.

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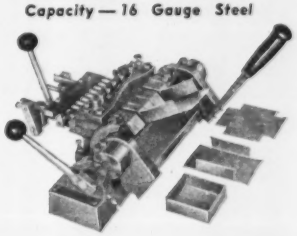

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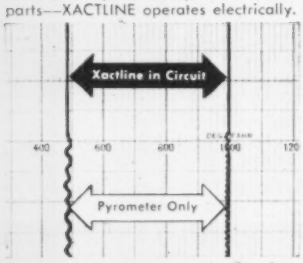

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Scrap . . .

Scrap Prices, Page 160

Philadelphia—Under "super-allocations" steel scrap is leaving this district for Middletown, O., Youngstown, O., and Cleveland for the account of Armco Steel Corp., Republic Steel Corp., and Jones & Laughlin Steel Corp. These allocations take precedence over other allocations in effect. No new allocations for local district consumers are reported. Unlike steel scrap, the cast grades appear in fair supply.

Bethlehem Steel Co. has developed a method for handling automotive grave yard scrap, which is facilitating the movement of such material. As most auto grave yard operators are not equipped to do an all around scrapping operation, Bethlehem is proceeding under a system whereby instead of carting away intact the stripped-down automobile hulks to a scrap preparation center, it first burns away all wood and upholstery and other combustible materials and then by aid of a mobile crane drops a two-ton piece of armor plate on the auto to compress it to a thickness of about one foot or a little more. This permits the hauling of several compressed vehicles on a truck to the mill for further preparation.

The price the company is able to pay the graveyard operator is said to be more attractive than otherwise, the operator getting as much as $25 to $30 out of each car, in addition to the parts that he already may have salvaged. Of the 300 cars or so reclaimed in this manner, the company has been able to get about 2200 pounds of scrap from each hulk.

Pittsburgh—Past week has shown a tightening in all grades. Allocations account in part for reduced supply but demand for additional tonnage by most purchasers is largely reflected. Steel plants and foundries are operating on critically low inventories, attempting to sustain peak production. Interest is focused more than ever on the Scrap Salvage Committee in the hope greater movement can be obtained.

Boston—Steel scrap movement is slightly improved but not to the extent inventories are mounting. Cast scrap stocks are better balanced and buying is more orderly.

New York—Scrap brokers find it difficult to supply sufficient open hearth scrap to meet even minimum requirements of customers. The mills are getting only enough tonnage to maintain meager inventories with a result requests have gone to Washington for further allocations. Cast scrap is freer than steel grades, although brokers have no trouble moving such tonnage as they can get their hands on.

Buffalo—Steelmaking operations in this district have recovered to 104 per cent of capacity following settlement of a plant railroad labor dispute. Pig iron production is at 100 per cent. Sustained improvement in flow of scrap has bolstered sentiment in the market.

Detroit—Local mills are concerned over the decline in automotive scrap generation. Scrap thus far dug out by the drive provides only a partial offset to this loss. Some of the more easily obtainable grades such as borings and turnings have tightened up and only slight progress is being made in building stocks for winter.

Cleveland—Considerable scrap tonnage is being allocated from distant points to mills in this and the Valley districts. Processing of local scrap is reduced by effects of hot weather and no substantial pickup is expected until the middle of September. In addition to the actual physical shortage of material, the consuming industry's supply is threatened by a possible car shortage later in the year.

Youngstown—Acute winter scrap shortage is feared by the steel mills here unless there is a decided improvement in stockpiling. Most steelworks now are down to 10 days' inventory. Normally, they would be holding at least two months' stocks, with receipts increasing seasonally.

Cincinnati—Mill inventories remain critical. The melt is increasingly dependent on allocations. Impending increase in freight rates failed to bring a rush of shipments. Dealers are expecting a stepup in foundry buying.

Washington—Defense Production Administrator Fleischmann last week called an emergency conference for Sept. 11 to discuss the acute shortage of steel scrap. While the current scrap drive is making headway, greater efforts will be needed to bring out the 36 million tons required if the 1951 steel ingot and castings goal of 110 million tons is to be attained. More than 400 have been invited to the conference.

Chicago—Receipts of open-hearth and electric furnace grades of scrap slightly exceed consumption but the margin is too small to be comforting. Fears of critical shortages next winter predominate all thinking. Blast furnace scrap is quite easy with several consumers out of the market.

St. Louis—Scrap shipments through dealers are down. Drop is worse than seasonal and outlook for winter stockpiles is poor. Consumers complain quality is deteriorating. One mill buyer says he "never saw scrap so full of hay." Foundry demand is far down. They have close to 60 days' stocks on hand and their new orders are shrinking.

San Francisco—Small shipments of scrap from Hawaii are supplementing domestic supplies, but tonnage from the Islands is too small to materially improve the supply outlook.

Seattle—Scrap receipts are fair but they are falling below current consumption. Quality of material coming onto the market is deteriorating. Competition is lowering grade standards as collectors go farther afield, accepting material heretofore rejected.

Bids to Lewiston, Idaho, for 200 tons of steel from the old Clearwater river bridge, brought a high tender of $27 per ton. Nine offers were received.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 157

Cleveland—Easier demand that has prevailed in the oven coke trade over recent weeks is expected to fade out now that the vacation season is about over. Increased foundry activities

are indicated in the offing as more shops get into defense and related production. Supply of coke is expected to be adequate though tight.

Additional coke-making capacity is projected for this area but the product of the new ovens will go chiefly into steelmaking consumption. Speculation as to where the Ford Motor Co.'s new Cleveland foundry would get its coke supply has been removed by announcement Ford will install additional coke facilities in the Detroit area, from which plant its Cleveland needs will be filled.

Warehouse . . .

Warehouse Prices, Page 159

Cleveland—Warehousemen in this area expect issuance by OPS of a new warehouse price regulation within the next week or so. The regulation has been under consideration for some time past, but details have not been disclosed. However, it is reported the order will permit of a percentage profit above costs.

To what extent prices will rise to reflect costs since the outbreak of the Korean war is uncertain. But the recent 5 per cent freight rate increase, effective Aug. 28, and which the warehouses are currently absorbing, is believed certain to be passed on to customers.

Expectations are demand pressure on the distributors will increase noticeably now that the vacation season is about completed.

Meanwhile, inventory position of the warehouses continues unsatisfactory. Hopes for building inventories are brightened by proposed amendment of NPA order M-6, to be issued shortly.

Philadelphia—Warehouse business for August held around the July level. September may see stronger pressure for tonnage, but likely little change in volume on a daily basis.

Cincinnati—Tonnage of steel being received by warehouses is somewhat smaller than receipts during July. Meanwhile, demand has been rising.

Chicago—Warehouses continue to lose ground inventory-wise. Because stocks are low and unbalanced sales are geared closely to receipts. Some relief had been hoped for in fourth quarter by proposed increase of mill allotments from 85 to 100 per cent of base period but this now seems pushed off to first quarter.

Los Angeles—Testifying to fabricators' difficulties under CMP confusion, is the experience of a local fabricator who contacted NPA for aid in obtaining emergency steel requirements. He was given a list of the steel warehouses, told to contact them personally in the chance that one might have the steel he required.

Seattle—Demand for out-of-stock items continues strong but confusion over interpretation of CMP directives is handicapping small shops in placing their requirements.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

675 tons, 511-foot four-span plate girder bridge, Farmington river at Poquonnock, Windsor, Conn., to American Bridge Co., Pittsburgh; Brunalli Construction Co., Inc., Southington, Conn., general contractor.

625 tons (previously reported as 1060 tons) state bridges, Leominster, Mass., to Bethlehem Steel Co., through Bayer & Mingolla Construction Co., Worcester, Mass., general contractor.

500 tons, Juneau avenue bascule bridge, Milwaukee, to American Bridge Co., Pittsburgh.

500 tons, Wallula bridge, Washington state, U. S. Engineer project, to American Bridge Co., Portland, Oreg.; J. A. Terteling & Sons, Boise, Idaho, general contractors.

250 tons, Central hospital building, New Britain, Conn., to Berlin Construction Co., Berlin, Conn.; Vermilya-Brown Co., New York, general contractor.

200 tons, Army hangar, Alaska, to Pacific Car & Foundry Co., Seattle; Peter Kiewit & Sons, Seattle, general contractors.

175 tons, railroad crossing underpass and bridges, Caribou, Me.; 105 tons to Bancroft-Martin Rolling Mills Co., Portland, Me., and 70 tons to Cyr & Denico Co., Waterville, Me., general contractor.

150 tons, addition to Rock Island power dam, Washington state, to Pacific Car & Foundry Co., Seattle.

100 tons, state bridge and approaches, Great Barrington, Mass., to American Bridge Co., Pittsburgh; W. W. Wyman Inc., Greenfield, Mass., general contractor.

80 tons, Mores Creek bridge, Boise county, Idaho, U. S. Engineer relocation project, to unstated interest; Roy L. Blair & Co., Spokane, Wash., general contractors.

STRUCTURAL STEEL PENDING

13,430 tons, structural steel bridge beams and girders; bids Sept. 4, Corps of Engineers, St. Louis.

4560 tons, Forest Hills overpass, Boston; A. V. Taurasi & Co., Somerville, Mass., low on combined contractor; also 580 tons reinforcing and 115 tons steel sheet piling.

2000 tons, estimated, Weyerhaeuser Timber Co. kraft plant, Everett, Wash.; L. H. Hoffman Co., Portland, general contractor.

1500 tons, nylon plant addition, near Pensacola, Fla.; bids asked. This is in addition to 5000 tons for the initial unit recently noted as going to Bethlehem Fabricators Inc., Bethlehem, Pa.

1060 tons, eight state bridges, Fall River expressway, Fall River-Freetown, Mass.; M. DeMatteo Construction Co., Quincy, Mass., low, $3,110,313.45; also 305 tons reinforcing required in structures.

927 tons, state bridgework, Cumberland and York counties, Pennsylvania; general contract awarded to Pennsylvania Quarry & Stripping Co., Hazelton, Pa.

865 tons, state bridge, Union county, New Jersey; general contract awarded to Villa Contracting Co., Westfield, N. J.

320 tons, Army power and heating plant, Whittier, Alaska; general award to Haddock Engineers, Seattle, on rebid, $4,118,252.

195 tons, state bridge, Chester county, Pennsylvania; bids Sept. 14.

185 tons, state bridge, Fulton county, Pennsylvania; general contract awarded to Pennsylvania Quarry & Stripping Co., Hazelton, Pa.

175 tons, alert hangar, Andrews Air Force Base, Maryland; bids Sept. 13, Corps of Engineers, Washington.

150 tons, state highway bridge, Westfield, Mass.; E. T. O'Neil & Sons, Holyoke, Mass., low.

Unstated, outside facilities, Whittier, Alaska; general contract to Haddock Engineers, Seattle, $1,678,500.

Unstated, steel frame laboratory and pile technology buildings, Hanford Works, Washington state; bids Sept. 5 to General Electric Co., Richland, Wash.

REINFORCING BARS . . .

REINFORCING BARS PLACED

725 tons, Manton Heights housing project, Providence, R. I., to Bethlehem Steel Co.; Gilbane Building Co., Providence, general contractor.

694 tons, including 677 tons bars and 17 tons mesh, building No. 44, Nash Motors Divi-

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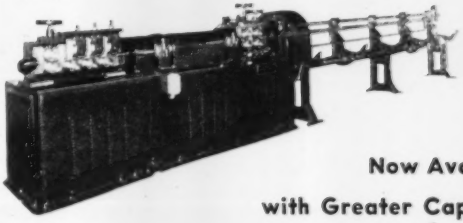

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sion, Nash-Kelvinator Corp., Kenosha, Wis., to Permanent Construction Co., Milwaukee.

300 tons, plant, Allis-Chalmers Mfg. Co., Terre Haute, Ind., to Truscon Steel Co., Youngstown.

195 tons, plant, Leviton Corp., Chicago, to Truscon Steel Co., Youngstown; Gateway Construction Co., Chicago, contractor.

143 tons, expansion, Phoenix Trimming Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago; Ragnar Benson Inc., Chicago, contractor.

121 tons, North Side grade school, Des Plaines, Ill., to Joseph T. Ryerson & Son Inc., Chicago; Power Construction Co., Oak Park, Ill., contractor.

120 tons, new building, All-State Insurance Co., Skokie, Ill., to Joseph T. Ryerson & Son Inc., Chicago; Ragnar Benson Inc., Chicago, contractor.

100 tons, foundations, building No. 45, Nash Motors Division, Nash-Kelvinator Corp., Kenosha, Wis., to Permanent Construction Co., Milwaukee.

100 tons or more, dormitories, University of Georgia, Athens, Ga., to Joseph H. Fox Co., Birmingham; Ray M. Lee Co., Atlanta, general contractor; structural steel to Breman Steel Co., Atlanta.

REINFORCING BARS PENDING

8000 tons, miscellaneous buildings, finance center, Ft. Benjamin Harrison, Indianapolis; bids Sept. 11.

2000 tons, steel wire strand, Corps of Engineers, Memphis, Tenn.; bids Sept. 19.

1250 tons, approximately, substructures for three bridges for Delaware River Joint Toll Bridge Commission, Trenton, N. J.; bids Sept. 14: Contract 101, Delaware Water Gap bridge, 900 tons; contract 201, bridge between Portland, Pa., and Columbia, N. J., 200 tons; contract 301, between Milford, Pa., and Montague, N. J., 150 tons, with alternate of 135 tons.

950 tons, Mayo Memorial hospital, Minneapolis; bids Aug. 29.

750 tons, two 750-man barracks, Elmendorf air field, Alaska; L. E. Baldwin Inc., Seattle, low $3,481,409.

700 tons, kraft mill, Weyerhaeuser Timber Co., Everett, Wash.; general contract to L. H. Hoffman Co., Portland, Oreg.

215 tons, substructure, bridge, near Sanish, N. Dak.; bids Sept. 21, Corps of Engineers, Fort Lincoln, N. Dak.

145 tons, residence units, mentally sick children, Institute of Juvenile Research, State of Illinois, Chicago; bids Aug. 28.

145 tons, reinforced concrete highway, East Hartford, Conn.; D. V. Frione Co., New Haven, Conn., general contractor.

140 tons, reinforced concrete highway, Darien, Conn.; D'Addario Construction Co., Bridgeport, general contractor.

100 tons, railroad bridge relocation, O'Hare Field, Chicago; bids Sept. 25.

Unstated, 1000-seat theater, Fort Richardson, Alaska; bids to U. S. Engineer, Anchorage, Alaska, Sept. 21.

Unstated, Dentistry, Medical & Pharmacy Bldg., University of Illinois, Chicago; bids Sept. 18.

Unstated, housing project, Minneapolis; bids Sept. 7.

Unstated, tank farm boiler and pump house, U. S. Government Public Building Service, Hammond, Ind.; bids Sept. 6.

Unstated, dormitory, University of Illinois, Urbana, Ill.; bids Sept. 5.

Unstated, hospital, Crookston, Minn.; bids Sept. 4.

Unstated, laundry building, U. S. Veterans Administration, Hines, Ill.; bids Oct. 9.

Unstated, hangars, Trans World Airlines, Municipal Airport, Chicago; bids Sept. 10.

PLATES . . .

PLATES PLACED

160 tons, stainless, also 58 tons stainless sheets, Navy purchasing office, Washington, to Alleghany Ludlum Steel Corp., Brackenridge, Pa.

100 tons or more, nonmagnetic floats, type O, Navy purchasing office, Washington, to National Steel Construction Co., Seattle, $402,689.31.

Unstated, nonmagnetic floats for U. S. Navy; $250,000 contract to National Steel Construction Co.; Seattle.

PLATES PENDING

100 tons, steel piling and other items, Sitka highway bridge, Alaska; Stock & Grove, Anchorage, low $675,410 to Bureau of Public Roads, Juneau, Alaska.

Unstated, tanks and facilities, kraft plant, Weyerhaeuser Timber Co., Everett, Wash.; general contract to L. H. Hoffman Co., Portland, Oreg.

Unstated, 24 underground, 50,000-gallons each, also two above ground 25,000-gallons each gas tanks for Fairchild air field, Washington state; bids to U. S. Engineer, Walla Walla, Wash., Sept. 18.

PIPE . . .

CAST IRON PIPE PENDING

500 tons, 16-inch cast iron pipe, Marblehead, Mass.; Warren Pipe & Foundry Co., Everett, Mass., low.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Erie, 13 diesel locomotives; purchase authorized by directors.

RAILROAD CARS PLACED

Gulf, Mobile & Ohio, 250 hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Bessemer & Lake Erie, 500 seventy-ton ore cars; bids asked.

Norfolk & Western, 1000 seventy-ton gondola cars; bids asked.

Virginian, 1000 fifty-ton hopper cars; pending.

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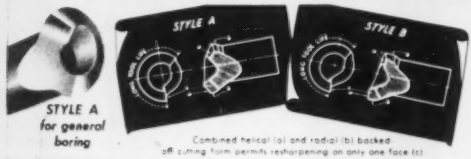

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STYLE B for bottoming and facing

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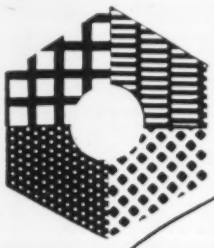

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Maryland Forge Expands

Maryland Forge Corp., Baltimore, is erecting a building at 5300 Pennington Ave., that city, for the handling of general forge work. Julius Pressman is president.

Fine Stainless Steel Co.

Maryland Fine & Specialized Wire Co., Cockeysville, Md., awarded a contract for the erection of a 12,000-square foot addition, doubling the size of its present plant. In addition, a new department for stainless steel fine wire is being equipped and company has been incorporated under the name of Fine Stainless Steel Co. Inc. to handle the operations.

United Mfg. Buys Plant

United Mfg. Co. bought a new plant at 32 Interstate St., adjacent to its No. 1 plant in Bedford, O. This acquisition will double the present facilities for manufacturing axles, retractable landing gears and break controls for industrial, farm and military applications. F. M. Klaus is president.

Will Help Build Carriers

Food Machinery & Chemical Corp.'s John Bean Western Division and Anderson-Barngrover Division at San Jose, Calif., and Peerless Pump Division at Los Angeles will help fill the parent company's contract for armored personnel carriers. The new type vehicle (STEEL, Aug. 27, p. 48) will be produced at the company's new Ordnance Division facilities at San Jose. In addition, several hundred subcontractors and suppliers will be engaged in the project.

Enlarges Ship Repair Yard

Ship repair yard of Bethlehem Steel Co., Shipbuilding Division, 1100 Key Highway, Baltimore, is being enlarged by the erection of an addition to its machine shop; also by an extension to its floating dry dock. In addition to necessary added equipment a number of machines now in use in the machine shop are to be replaced by others of a later design.

T.C. & I. Moves Offices

General offices of Tennessee Coal, Iron & Railroad Co. on Sept. 10 will have a new address, P. O. Box 599, Fairfield, Ala. All departments which formerly were located in downtown Birmingham and a number of others which have been scattered in many other locations will be brought together under one roof in a new building atop Flint Ridge, overlooking Fairfield, eight miles from the heart of Birmingham and six miles from Bessemer. At the same time, a downtown office of the company's department of public relations will be established at 1429 Brown-Marx Bldg., Birmingham.

Westinghouse Plant Opens

Limited defense production is expected to start during the week of Sept. 4 at Westinghouse Electric Corp.'s Television-Radio Division plant at Metuchen, N. J. Division manager is F. M. Sloan. Initial production, using only a small portion of manufacturing space in the $1.5 million plant, will be "confidential equipment of an electronic nature for the armed forces."

Gets Fuel Tank Contract

American Stove Co., St. Louis, will start production soon on large fuel tanks for three major aircraft firms manufacturing B-47 superjet bombers. These firms are Boeing Airplane Co., Wichita, Kans., Douglas Aircraft Co., Tulsa, Okla., and Lockheed Aircraft Corp., Marietta, Ga. Part of American Stove's St. Louis domestic range factory will be converted to accommodate the project which requires advanced methods of fabrication.

Luria Opens Seattle Office

Luria Bros. & Co. Inc., Philadelphia, opened a branch office at 1121 Smith Tower, Seattle. Herman Keisler, previously in the company's San Francisco office, is in charge of the Seattle office. Stanley Claster is Luria's West Coast manager. Serving steel companies with iron and steel scrap, Luria Bros. & Co. have been opening new offices in the West to handle requirements of new steel centers.

Diamond Alkali To Expand

Diamond Alkali Co., Cleveland, plans a two-year multimillion dollar program of expansion at its Painesville, O., plant. The project embraces extensive enlargement and modernization of present facilities which will enable the company to step up output of caustic soda and chlorine substantially by the electrolytic method. It also includes construc-

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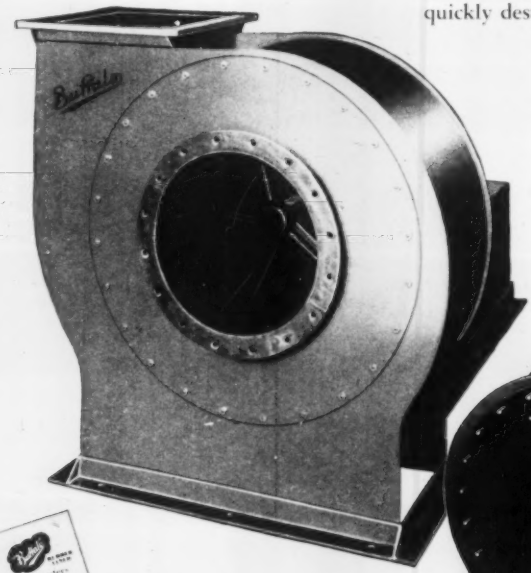

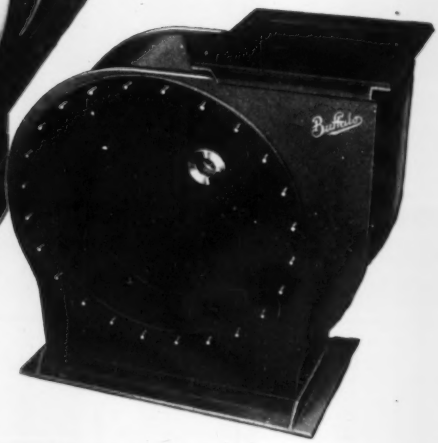

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tion of a new plant for producing perchlorethylene, a chlorinated hydrocarbon solvent whose industrial applications have increased sharply in recent years.

Read Standard Corp.

Standard Stoker Co. Inc., New York, and its Read Machinery Division, York, Pa., changed the corporate name to Read Standard Corp. The company has a foundry and works in Erie, Pa., and a branch in Chicago.

Erie Firms May Merge

Sale of National-Erie Co., Erie, Pa., to Bucyrus-Erie Corp. for a price reported to be $3,760,000 is being considered. Bucyrus-Erie reportedly seeks to acquire the Erie plant to have a more certain source of steel castings.

Bethlehem Forms Ore Firm

Bethlehem Steel Co. established Marmorton Co., a firm to develop iron ore at Marmora, Ont. The ore will be moved to Lake Ontario for shipment and is expected to be consumed at Bethlehem's Lackawanna, N. Y., plant.

Produces Iron Pipe on Coast

General Metals Corp., San Francisco, took over the malleable iron pipe business of Pittsburgh Valve & Fittings Corp., Barberton, O., and will transfer the equipment, tools and inventory of the business to its San Francisco and Los Angeles Pacific Fittings Division.

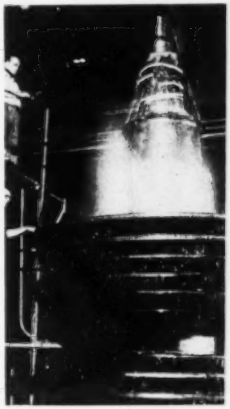
General Metals, a subsidiary of Transamerica Corp., recently purchased the Pacific Fittings Division. Acquisition of the Barberton firm's equipment will result in an expansion of that division to "the first fully integrated complete line manufactured on the West Coast," says William E. Butts, president of General Metals.

Gets Contract for Big Plant

Stearns-Roger Mfg. Co., Denver, has the contract for engineering, construction and purchasing of equipment, materials, etc., for the complete gasoline plant to parallel the Stanolind Oil & Gas Co.'s present plant near Ulysses, Kans. Cost of the plant is estimated at $2,750,000.

Thompson Products Expands

Steel fabricating plant in Danville, Pa., which National Radiator Co., Johnstown, Pa., purchased in December, 1950, was sold on Aug. 10 to Thompson Products Inc., Cleveland. The 140,000 square feet of manufacturing space will be devoted to the manufacture of component parts for the aviation industry. During World War II, Rheem Mfg. Co., New York, used the plant, then government-owned, for the manufacture of war materials. Webrib Steel Corp., New York, then took over the plant and had been producing reinforced steel products there until the factory's transfer to National Radiator.



CASCADE: This industrial waterfall plays an important part in manufacture of steam turbines at General Electric Co.'s Schenectady Turbine Divisions. Bores are expanded in an oven and shrunk-tight to main shafts by the cascade of water. Checked closely are fitting of keys and position of the wheel on the 30-foot shaft

Harrison Buys Building Site

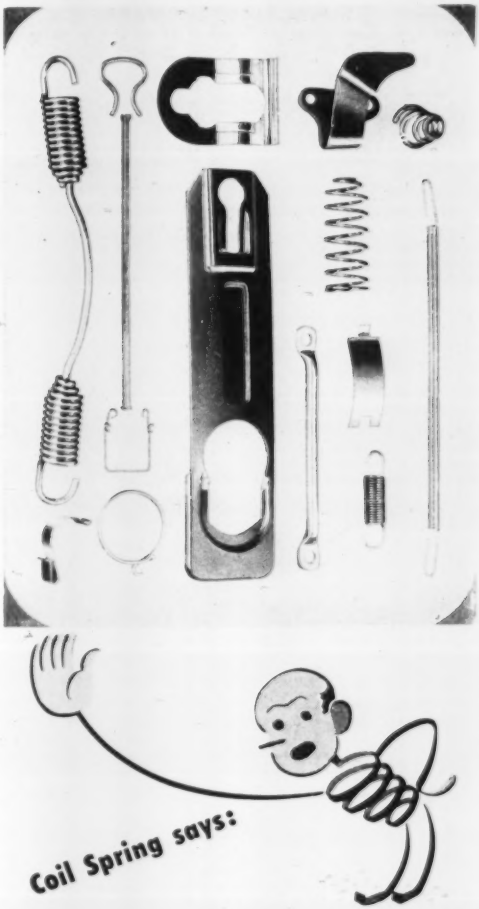
Harrison Radiator Division, General Motors Corp., Detroit, purchased 89 acres of land adjacent to its West Lockport, N. Y., plant. The property was acquired for possible future expansion.

Standard Transformer Agent

Carl A. Froebel Co., recently appointed by Standard Transformer Co., Warren, O., as its representative for eastern Missouri and southern Illinois, is located at 4030 Chouteau Ave., St. Louis.

Mack Trucks Builds Plant

Mack Trucks Inc., Long Island City, N. Y., is constructing a service parts plant in Bridgewater, N. J. The parts building and offices will occupy about 425,000 square feet. Upon completion of the new plant, the building now being used for service parts supply at Plainfield, N. J., immediately adjacent to the Plainfield engine and transmission plants, will become available for the production of vehicle engines and transmissions, thus providing



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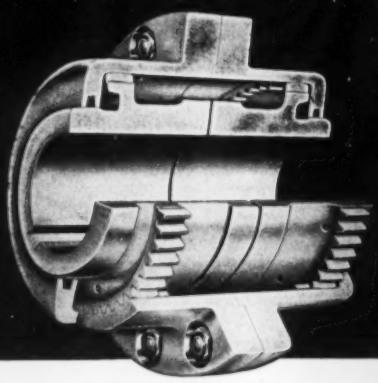

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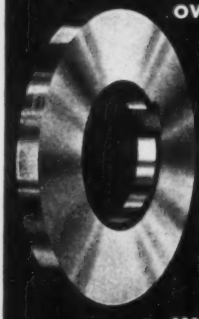

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about 300,000 square feet of space for expansion of the Plainfield manufacturing plants.

Waage Electric Builds Plant

Construction of a plant in Kenilworth, N. J., for Waage Electric Inc. is virtually completed. Occupancy is scheduled for early September. The firm, formerly the A. H. Waage Electric Co., manufacturer of custom-made electrical heating devices and controls, has been located in New York City for over 35 years.

Athey Products Corp.

Athey Products Corp., Chicago, manufacturer of heavy earthmoving equipment, established a Contract Mfg. Division to handle the production of component parts for other manufacturers and the government.

Griscom-Russell Co. Moves

Griscom - Russell Co. will move its general offices from New York to Massillon, O., where its plant for manufacturing heat transfer apparatus of all types is located. Griscom - Russell's New York office at 285 Madison Ave. will continue to operate as one of the more than 25 sales offices in the United States.

Babcock & Wilcox Tube Co.

Babcock & Wilcox Tube Co., Beaver Falls, Pa., offers improved sales service for users, fabricators and distributors of its steel tubing through the company's new sales headquarters at 1111 Wilshire Blvd., Los Angeles. H. F. Lefferty is the Pacific Coast manager for the company.

Bendix Utica Division

Utica, N. Y., Division of Bendix Aviation Corp., Detroit, will swing into production before the end of the year, says Donald M. McGrath, general manager. Availability of production machinery will determine the length of time necessary to bring employment up to the scheduled level of 2000.

Dow Corning Moves Office

Dow Corning Corp., producer of silicone greases, fluids, insulating compounds, etc., moved its New York office to 600 Fifth Ave.

Whitney Chain Assigns Work

Whitney Chain Co., Hartford, Conn., transferred its Woodruff Key Division to Standard Steel Specialty Co., Beaver Falls, Pa. This assignment includes the good will, manufacturing equipment and stock inventory of the Division. The transferal permits Whitney to utilize its complete plant capacity for the production of power transmission and conveying chain products. Standard Steel has established additional service facilities through a plant addition at Hammond, Ind., and will also utilize production and service facilities at its Beaver Falls plant.

Will Produce Magnesite

Standard Steel Corp., Los Angeles, was awarded a contract by Standard Slag Co., Gabbs, Nev., for the modernization of a kiln originally installed at Beatty, Nev. The modernized kiln will be used by Standard Slag for the production of magnesite.

United American Metals

United American Metals Corp., Brooklyn, N. Y., is expanding its Tyler, Tex., plant which will be especially equipped with facilities for defense work. The addition will provide 11,000 square feet of manufacturing space. The Texas plant does babbitting and general machine work.

Diamond Alkali Buys Firm

Diamond Alkali Co., Cleveland, will purchase all the common stock of Kolker Chemical Works Inc., Newark, N. J., subject to approval by Diamond stockholders. Kolker, with plants at Newark and Houston, manufactures a line of organic insecticides and agricultural chemicals.

Establishes Chicago Office

Electric Products Co., Cleveland, established a separate Chicago office devoted exclusively to the sale and servicing of battery charging equipment and traction motors for industrial trucks. Al. O. Seehafer is in charge of the new office.

Files Incorporation Papers

Companies filing charters of incorporation with the secretary of state's office, Dover, Del., together with the firms which are serving as their principal offices are: Metals & Chemicals Corp., Corporation Trust Co., Wilmington, Del.; North River Steel Corp., steel containers, $1 million capital, Registrar & Transfer Co., Dover; Berry Machinery Corp., Corporation Trust Co., Wilmington; Hillman Corp., machinery, U. S. Corporation Co., Dover; Hathaway Steel Corp., Colonial Charter Co., Wilmington; Jones & Armstrong Steel Co., Corporation Service Co., Wilmington; Chemanganese Inc., metals, Prentice-Hall Corporation System Inc., Dover; Fabricators Mfg. Co. Inc., steel products, Philip Cohen, Wilmington, serving as the resident agent.

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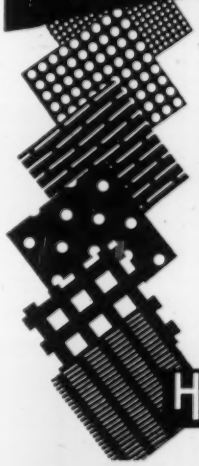

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1—21" Leblond Hevi-Duty Plain Production Lathe With Drive & Motor & Controls Serial #M-691	1650.00
1—12" x 18" Porter-Cable Carbo Lathe Hyd. Complete With Motors—Hyd. Unit & Controls—6" Air Chuck With All Accessories—220/3/60 Serial #501CH	4745.00
1—#3 Reed-Prentice Vertical Miller Serial #12798	1750.00
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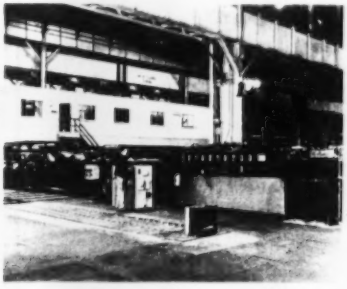
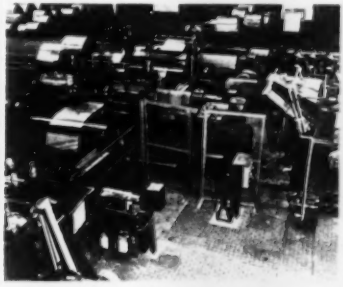
84" SHEAR LINE

The Aetna-Standard 84" Shear Line for cold-reduced product at the Gary Sheet and Tin Mill, plant of U. S. Steel Company, features several innovations. In this view, from the entry end, you can see the mandrel type pay-off reel for 72,000 lb. coils; a special loading ramp to prevent coil damage; pinch roll unit; looping pits; 16" heavy duty side trimmer and Hallden Flying Shear.





The delivery end features a magnetic prime piler. The Side Trimming and Shearing Line features a Scrap Baller forming a ball 36" O.D. x 60" wide. The line speed is 90' to 450' per minute, processing sheets from 30" to 200" in length, widths from 18" to 74".

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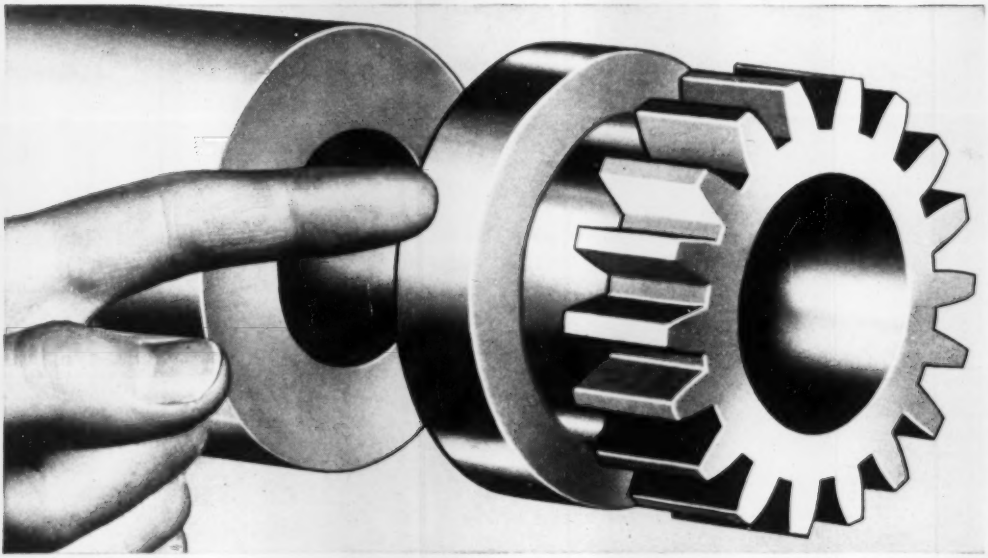

WHEN you use Timken® seamless tubing for your hollow cylindrical parts, the hole is already there. As a result, you machine away less scrap than you do with bar stock—get more parts per ton of steel.

Using tubing also boosts the productivity of your machine tools. Since drilling the center hole is eliminated, finish boring is often your first production step. Screw machine stations are released for other operations. You have more machine capacity without adding more machines.

What about quality of product? Because the piercing process by which Timken tubing is made is basically a forging operation, the tubing has a uniform spiral grain flow for greater strength and a refined grain structure which brings out the best in the quality of the metal. And this fine forged quality is uniform from tube to tube and heat to heat, thanks to the Timken Company's rigid quality control.

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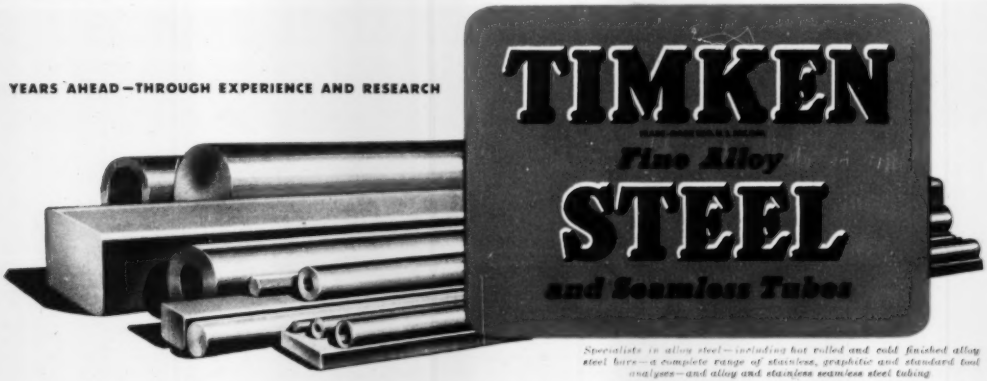

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